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American Association Takes Action on Convention

Canadian War Experiences

Southwestern Association Meets

ELECTRIC RAILWAY JOURNAL

New York, May 5, 1917 McGraw-Hill Publishing Co., Inc. Vol. 49, No. 18 10c a copy

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FOR POWER BY LAND AND AIR

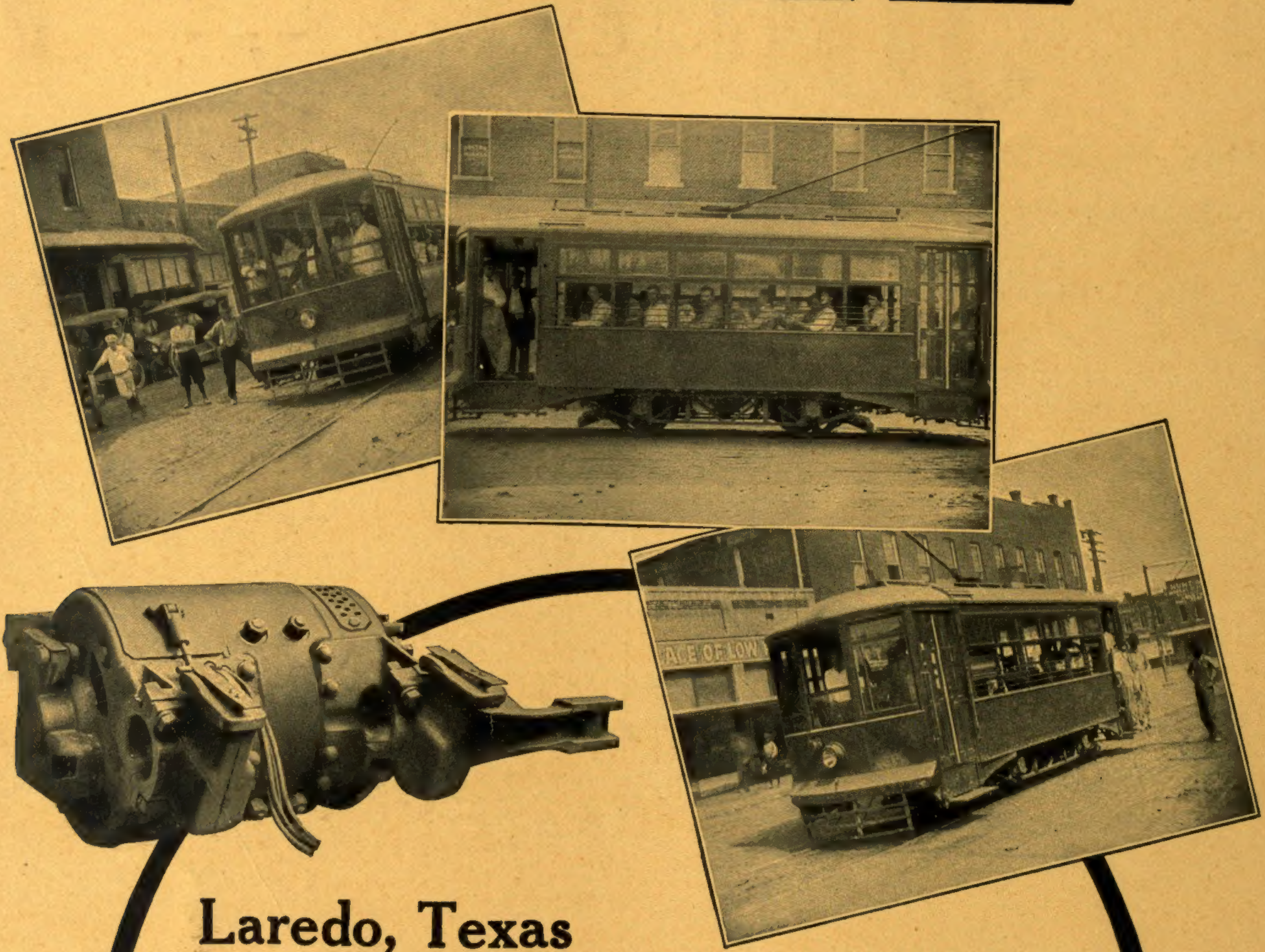
To meet the greatly increased demand for airplane and automobile motors the Simplex Automobile Company needed four times as much manufacturing space as they had. Knowing that Westinghouse Church Kerr are constantly mobilized for quick work they called on us to design and construct the extensions.

The contract for the great new machine shop with a hundred thousand square feet of floor space was signed on December 4th. Plans were made and the shop was constructed and in use, fully equipped, on March 4th. About a dozen other buildings were carried on simultaneously, giving the Simplex Automobile Company a large modern plant at the very time when such facilities are most needed. All of the work was designed and constructed by Westinghouse Church Kerr.

ENGINEERS and CONSTRUCTORS
A purely engineering organization with nothing to sell except services.
W·C·K

WESTINGHOUSE CHURCH KERR & CO.
Engineers & Constructors
37 WALL STREET, NEW YORK CITY
CHICAGO, Conway Building MONTREAL, Shaughnessy Building SAN FRANCISCO, Pacific Building

The One Man Car



Laredo, Texas

The Laredo Electric Railway Co. gives a good example of efficient one-man car operation serving this thriving agricultural center. The cars are equipped with

Westinghouse Light-Weight No. 505 Motors

Laredo is a sub-port of entry and one of the principal jobbing centers of trade between the United States and Mexico. It is in the midst of an extensive farming and stock-raising district. One of the principal farm crops is Bermuda onions, 1500 acres being under cultivation, producing 20,000 pounds of onions per acre. Bricks constitute the principal manufacturing product.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.
Sales Offices in All Large American Cities 658

W
WESTINGHOUSE ELECTRIC

Westinghouse

ELECTRIC RAILWAY JOURNAL

VOLUME XLIX, No. 18 NEW YORK, MAY 5, 1917 PAGES 811 TO 856

CONTENTS

Best Medical Attention Pays

W. M. Holtz, M.D., tells how the Pittsburgh Railways and affiliated companies have built up cordial relations with local physicians; how the companies care for injured men and promote their welfare....Page 816

Convention of Southwestern Association at Dallas

At its session the railway section discussed papers on the subjects of power stations, track, car, car shops, automobile competition and other present-day problems ....Page 819

Canadian Experiences in War Time

Even with nearly 6 per cent of the population under arms, the electric railway industry of Canada has been but slightly affected by the war. In spite of labor shortage traffic has been stimulated ....Page 823

EQUIPMENT AND ITS MAINTENANCE......832

Economical and Effective Method of Repairing Old Rail Joints—*By R. H. Findley.*
Single-Truck Cars Remodeled Into One-Man Type.
Dustless Ash Removal.
Asbestos and Varnish Make Good Field-Coil Insulation—*By F. J. Foote.*
Home-Made Air-Operated Punch—*By G. B. Sisson.*
Sea Air No Tonic for Gulfport Cars.
New Tower Truck of Compact Type.
Home-Made Switch to Operate Sump Pump.
Reclaiming Waste and Lubricating Oil.
Rack for Jacks in Emergency Car.
Washing Cars Instead of Sweeping Them.
A Guard for Third-Rail Approaches.
A Catenary Hanger with But Five Parts.
New Contact Spring for Trolley Harps.
Oxy-Acetylene Welding Practice in Des Moines Shop.
Curtain Printing Press Used at Nashville.

EDITORIALS 811

Railways Can Help Sell New Bonds.
"Have You Bought Your Bond?"
Better Medical Relations.
Remedying the Coal Situation.
The Nation Needs Money.
A Freak Ordinance at Los Angeles.
Savings Possible in the Coal Pile.
Electric Railway Earnings Compared.
A Resolution of the American Electric Railway Association.
Approve Plan of No Convention.

THE INFLUENCE OF THE AUTOMOBILE ON THE INTERURBAN 820

BETTERMENT OF POWER PLANT MANAGEMENT 820

THOUGHTS ON CAR-SHOP PRACTICE.......822

AN APPEAL TO AUTO OWNERS............822

CREATING PASSENGER TRAFFIC 826

PREPARATIONS FOR SHORTAGE OF FOOD AND LABOR 827

RECENT BULLETINS IN THE B. R. T. EFFICIENCY CAMPAIGN 829

SAFETY MEDALS PRESENTED 829

COMMUNICATIONS 830

Equalizer Bars Not Necessary.
Good Watches and Uniform Loading.

AMERICAN ASSOCIATION 831

NEWS OF ELECTRIC RAILWAYS............838

Dallas Charter Amendments Upheld.
Senate Passes Commission Bill.
Union Terminal for Los Angeles.
Santa Fe Electrification Rumors.
Seattle Conferences Progressing.
Increase in Wages in Bangor.
Strike on Indiana Line.
Washington Inquiry Started.
Obstructionist in Cincinnati.
Late Mr. Reynolds Honored.
M. M. and M. C. B. Convention Postponed.
Bay Region Labor Troubles.
Coal a Problem in Cleveland.
Programs of Association Meetings.

FINANCIAL AND CORPORATE..............842

Electric Railway Earnings.
Connecticut Recognizes Utility Bonds.
Shore Line Program Approved.
Additional Financing Proposed.

TRAFFIC AND TRANSPORTATION...........846

Employees War on Jitneys.
I. C. C. to Consider Freight Advance.
Progress in Buffalo Survey.
Copper Fare Zones Authorized.
Chicago to Enforce Traffic Rules.
Dallas Jitney Ordinance Opposed.

LEGAL NOTES 848

PERSONAL MENTION 849

CONSTRUCTION NEWS 850

MANUFACTURES AND MARKETS...........853

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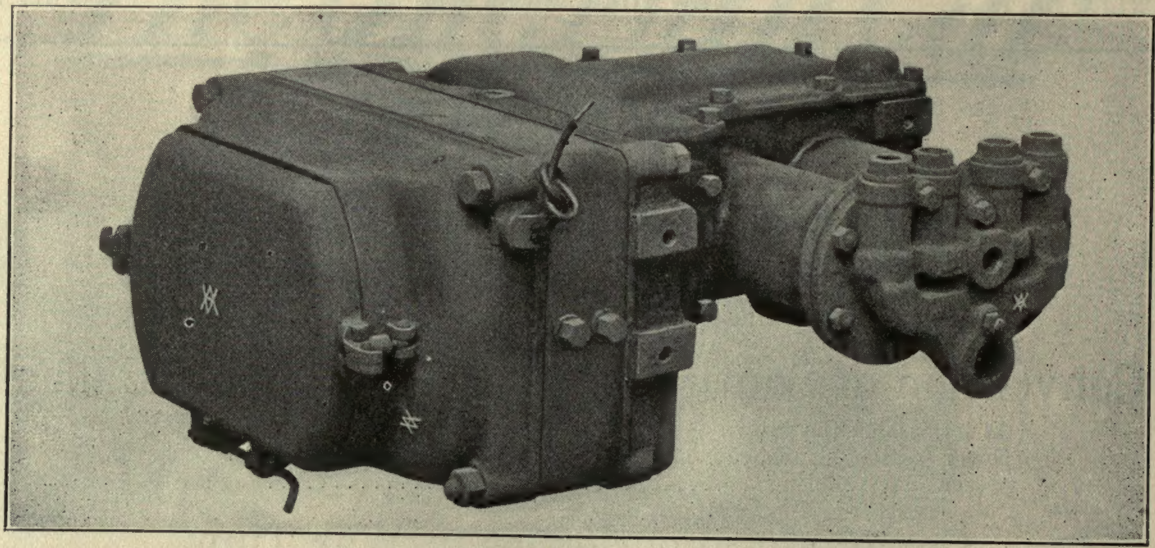
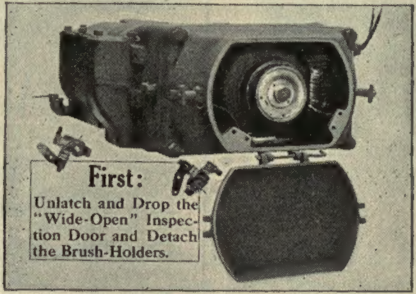


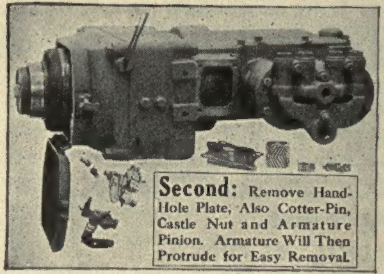
The

Westinghouse "Bungalow"

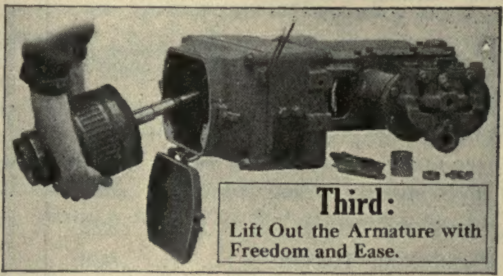
Compressor Offers Easy Removal by One Man of the Armature, Should Same for Any Reason Become Necessary, Without Detaching the Compressor from the Car Body, as follows:



First: Unlatch and Drop the "Wide-Open" Inspection Door and Detach the Brush-Holders.



Second: Remove Hand-Hole Plate, Also Cotter-Pin, Castle Nut and Armature Pinion. Armature Will Then Protrude for Easy Removal.



Third: Lift Out the Armature with Freedom and Ease.

Westinghouse Traction Brake Company

General Offices and Works: Wilmerding, Pa.

Atlanta, Ga.
Boston, Mass.
Chicago, Ill.
Columbus, O.
Denver, Col.
Houston, Tex.
Los Angeles,
Mexico City
New York, N. Y.
Pittsburgh, Pa.
Seattle, Wash.
San Francisco,
St. Louis, Mo.
St. Paul, Minn.

One of Five Safety Cars Built by the American Car Co. for the Union Depot Bridge and Terminal R. R. Co., Kansas City, Mo.

One Hundred and Fifty-one Safety Cars for Nine Other Street Railways Are on Order to Be Built at the Same Plant, All Equipped with Our Safety Car Brake Equipment and Safety Control Features.

SAFETY CARS

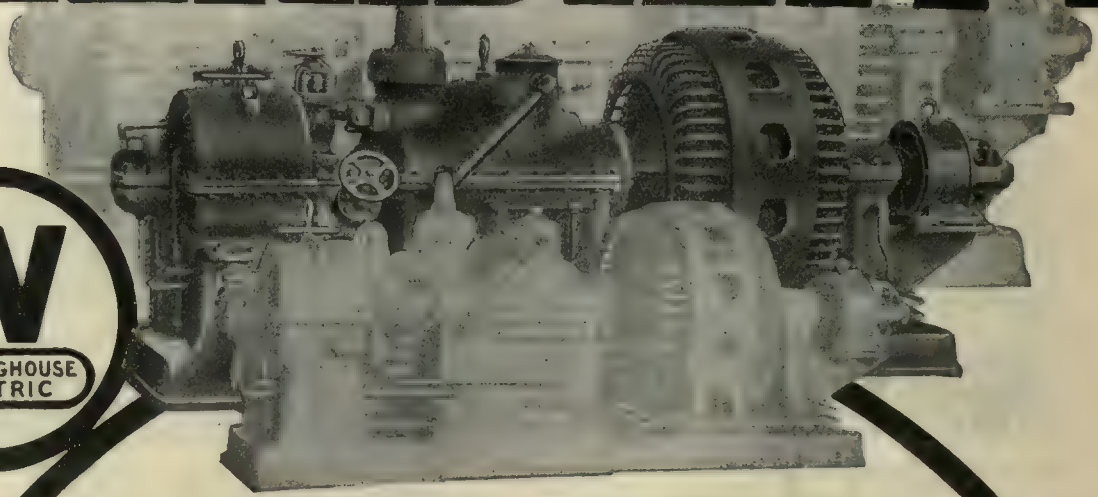
Operating on only one line in a large city where they recently displaced heavy double-truck cars are resulting in a saving at the rate of $6,000.00 annually with a 33% increase in service. This company now has 15 more equipments on order.

Let us explain.

Safety Car Devices Co.

Main Office, Boatmen's Bank Bldg.
ST. LOUIS, MO.

CHICAGO	NEW YORK	PITTSBURGH
Ry. Exch. Bldg.	**City Invest. Bldg.**	**Westinghouse Bldg.**



FLEXIBILITY

WESTINGHOUSE ELECTRIC

Full-Load Efficiency at Light Loads

In the plant with wide **daily** or **seasonal** load variations, flexibility is a valuable feature, but a rare quality is

Flexibility Plus Sustained Efficiency Over a Wide Load Range

Perhaps you have considered the Turbo-Generator a machine that will operate efficiently **only** when run at **"rating,"** or **"full load."** Perhaps you have felt that poor economy **at the lighter loads** was an unavoidable evil.

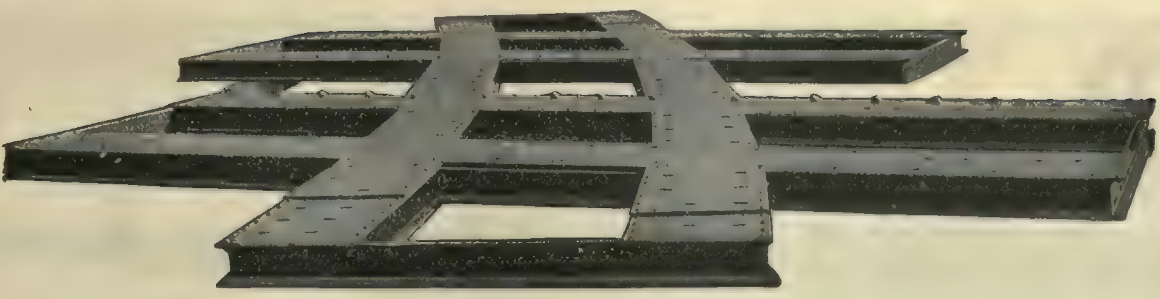
Westinghouse Geared Turbo-Generators

—were designed especially to eliminate the losses that are occasioned by fluctuating loads. Their economy remains practically constant over the entire load range.

These units are built in capacities from 15 to 1000 kilowatts, A.C. and D.C.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

Westinghouse



INTERNATIONAL
STEEL CROSSING FOUNDATIONS

Protect Your Crossing Frog Investment

A large percentage of crossing frog failures are due to broken bolts.

Broken bolts come from heavy traffic over unstable foundations. As a matter of fact most crossing frog failures are due to racking on unstable foundations and not to tread and flange wear.

Therefore good judgment demands the best possible foundation.

International Steel Crossing Foundations eliminate broken bolts and will double the life of a built up crossing frog.

They bridge all joints and act as a unit in bearing. They preserve the track surface under the most trying conditions.

All tamping is effective because all tamped surfaces are in effective bearing.

The cost of installing is no more than that for wooden ties and the unit bearing of a resilient steel foundation is substituted for the individual bearing furnished by a number of wooden ties.

Protect your crossing frog investment with International Steel Crossing Foundations.

Furnish us with your crossing angle and the lengths of the frog arms and we will give you the figures.

The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co., Los Angeles, Cal.
San Francisco, Cal. Seattle, Wash.
R. J. Cooper Co., Salt Lake City, Utah.
J. E. Lewis & Co., Dallas, Texas.
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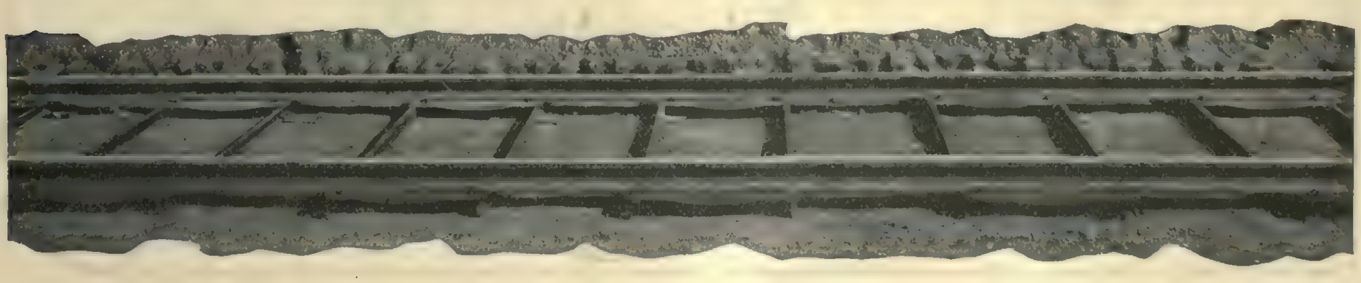


Using All the Light

Type S D P
For Interurban Service

A given headlight lamp produces a certain definite amount of light. It is the function of the headlight to put that light to the best account.

Crystal Ray Reflectors, which may be used in any Crouse-Hinds Imperial Incandescent Headlight of the City and Suburban or Interurban types, concentrate every available ray of light into a clear intense beam straight down the track. They are accurately ground and highly polished on both sides.

But much of the efficiency of a reflector is lost if the lamp is not in focus. Consequently Imperial Headlights have a simple focusing mechanism which makes the proper focusing of different lamps an easy matter.

Besides Crystal Ray, any Imperial Incandescent Headlight for City and Suburban or Interurban service may be supplied for Gold Ray (yellow light) or Sterling Ray (white light). The types for city only are furnished for Sterling Ray.

There is an Imperial Headlight for each particular requirement. Our engineers are ready to lend their specialized knowledge in selecting the proper headlights for your road.

Type W D S
For City and Suburban Service

The Ohio Brass Co.

Mansfield, Ohio

A Million Eyes

The metallurgist with his microscope studies in detail the structure of a bit of metal so small that it is almost imperceptible to the naked eye. He has the power of a million eyes.

Chemical analysis shows two samples to be the same. They look alike. But seen through the microscope, with their areas increased ten thousand, even a million times, their structure is different. The microscope shows that one is good and the other bad.

The microscope is but one of many agents regularly employed to check the quality of O-B Bronzes—to make sure you get the kind of metal you should have when you buy O-B Overhead Materials.

The Ohio Brass Co.

Mansfield, Ohio

Phono-Electric

Reports Read "Still Up"

Almost monotonous—that phrase "Still up" about so many installations in Philadelphia, one of the great Phono-Electric cities.

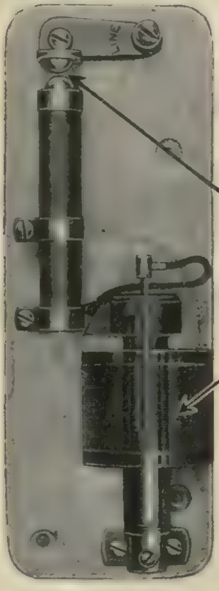
For instance, 2 miles of No. 0000 trolley wire have been up on Third Street between Brown and Reed ever since October, 1909.

It would mean much to your line department, to your rolling stock department and to your transportation department to network your city with a trolley wire that is good for double the life and many times the reliability of hard-drawn copper.

Continuity of service begins **at the top** with a wire that represents continuity of quality.

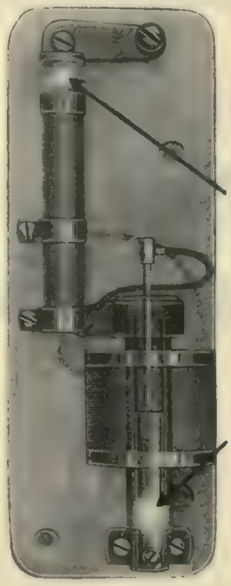
For Phono-Electric is Phono-Electric to the core. Besides possessing exceeding strength, ductility and toughness it possesses all these characteristics throughout its entire compass—not merely in its skin or surface.

BRIDGEPORT BRASS CO.
BRIDGEPORT CONNECTICUT



The safety of your electrical apparatus from lightning depends on this air gap remaining constant.

This circuit breaker assures that it will.



In the Garton-Daniels Arrester, the Arc is not cut off or extinguished here—at the air gap.

But here, inside a fibre tube, between iron and carbon. It simply dies out at the air gap.

Here's Why Your Lightning Arresters Should Have a Circuit Breaker. Study These Illustrations

Primarily, circuit breaker lightning arresters are efficient; **because of the circuit breaker they stay efficient.** Here's how—

There's just one main thing in a lightning arrester that stands for the safety of your electrical apparatus—a small air gap distance. It must be small (1/40 in. in the Garton-Daniels railway type) it must **stay** small—**at all times.**

After a lightning discharge passes through an arrester, a certain flow of line current follows it to ground. This must be instantly cut off. It must not be cut off or blown out at the air gap itself; because if it is, the gap electrodes will quickly burn away, the gap will lengthen, the arrester will lose its efficiency, and damage to your apparatus will result.

It must be cut off—**not at the air gap,** but some place else. **It must simply die out at the gap.**

Garton-Daniels Lightning Arresters

are the only lightning arresters doing this; they do it by means of a positive and automatic circuit breaker **in series with the gap** and operated by this flow of line current to ground. The arc is broken inside a fibre tube between iron and carbon. It simply dies out at the gap.

There is no wear and tear of the gap electrodes; the gap does not lengthen; the efficiency of the arrester is maintained; and this means that the protection to your apparatus is not reduced.

Get your lightning arresters now and see that they have this feature—it is of vital importance.

You can get Garton-Daniels Lightning Arresters from jobbers generally throughout the United States and Canada.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA	NEW YORK	CHICAGO
17th and Cambria Sts.	50 Church Street.	Monadnock Bldg.

Canadian Distributors—Lyman Tube and Supply Co., Ltd., Montreal, Toronto.

Milwaukee Northern Increased Its Night Passenger Traffic

Read This Letter

Milwaukee Northern Railway Co.
General Offices
Cedarburg, Wis., April 5, 1917.

Messrs. Holden & White, Chicago, Ill.

Gentlemen: Yours of the 3rd at hand. The principal advantage which has resulted from the operation of these regulators on our interurban cars in so far as passenger traffic is concerned is that during the winter months it is necessary to illuminate the interior of the cars shortly after 4.00 o'clock in the afternoon. We compete with the Chicago & Northwestern Ry. for through traffic between Milwaukee and Sheboygan. The southbound limited trains leaving Sheboygan at 3.05, 5.05 and 7.05 P. M. for Milwaukee are the heaviest southbound runs of the day and compete directly with equivalent service on the Chicago & Northwestern.

Previous to the installation of the regulators constant complaint was made by passengers, principally traveling salesmen, that the illumination was so poor that they could not make up their daily reports or read while in transit. At first but one car was equipped with these regulators and used on the 5.05 P. M. run.

The favorable comment which immediately resulted made this train very popular and influenced us in immediately equipping another car. As a result our through riding increased and we have, on account of the increase in business due to this improvement in illumination, equipped all of our cars with this device.

Since doing so our through travel has increased to a very large extent and we consider that a considerable portion of the increase is due to the proper illumination which we have provided. In addition we have made it possible to use incandescent high-power headlights with great satisfaction to our motormen.

Yours truly,

MILWAUKEE NORTHERN RAILWAY COMPANY,
(Signed) F. W. WALKER, General Manager.

1508 Fisher Building

Holden

General Sales Distributors for Th

By Equipping With Watson Car Lighting Regulators

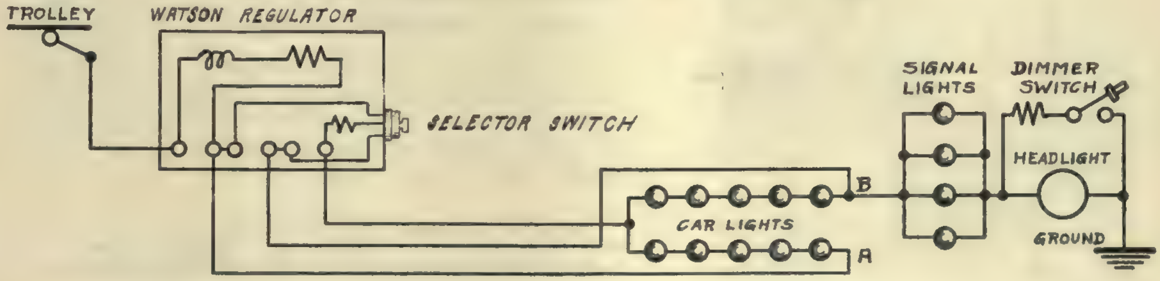
Where interurban parallel steam railways with schedules equal night passenger traffic moves to steam roads largely because of better car lighting. Travelling men particularly do this to check up their day's work. Reading cannot be done in comfort where lights are so affected by fluctuating voltage and comfortable conditions influence passenger business. Managers realize their inability to provide sufficient power for satisfactory car lighting without enormous transmission expense, and only one scheme to overcome this has proven satisfactory in service.

The Watson car lighting regulator makes possible interurban illumination equal to the steam railway coach, free from the effects of fluctuating voltage, controls both interior and headlights, provides the simplest car wiring, reduces current consumption, offers direct or indirect lighting, and can be installed on almost any car.

It is a fool-proof, reliable device consisting of electro-magnetic relays which operate as line voltage varies, and in 2 years' constant use not a single adjustment has been necessary. It maintains car lights at maximum intensity within a range of five per cent over a voltage drop of 280 volts. For example, on a maximum trolley voltage of 600 the regulator maintains normal illumination as low as 320 volts.

In effect the regulator puts the car lights in place of your old arc headlight resistance, thereby decreasing current consumed. It permits the use of standard listed street series 4-ampere gas-filled Mazda lamps, secured on your regular lamp contract. These are all low voltage lamps with heavy filaments and are not affected by vibration as are railway-series lamps. They have mogul sockets, thereby discouraging theft and decreasing lamp costs.

TRIAL INSTALLATIONS—In addition to the Milwaukee Northern complete installation four other prominent interurban properties are now trying the Watson regulator. We are prepared to furnish two additional cars with regulators for 60 days' trial. If you are interested write at once, sending print of your car wiring.



& White

Chicago, Illinois

Car Lighting Improvement Company

DREW SAFETY MIRRORS

enable you to handle summer traffic safely, quickly and more economically

Quick, nervous crowds—hurrying pleasure seekers, strangers in your city, women and children boarding your cars at the parks, and the host of feeble and infirm, that fair weather makes your passengers, demand the service that you can only secure from Drew Safety Mirrors.

This shows a Drew Mirror installed on a closed car. It acts as a valuable check on conductors' signals. Should passengers fail in boarding, the motorman does not start the car.

On open cars, the Drew Mirror gives the motorman a view of the running board so that he can co-operate intelligently with the conductor.

How the Drew Safety Mirror works and saves money for you

Installed on open or closed car—the Drew Mirror gives the motorman a clear view of the loading platform and running board without detracting his attention from the road ahead. He can watch traffic signals and passengers at the same time. This provides a very valuable check on stop and go signals. It obviates the majority of platform accidents and saves running time.

Thoroughly useful in every season

You'll note the decrease of claims from platform accidents as soon as your operators become familiar with the use of the device. This takes but a few days at most. The saving is as gratifying in winter as in summer and equally procurable.

One accident prevented more than pays for equipping all your cars

You'll save many times the amount in your Claim Department that it will cost you under the direction of your Master Mechanic to equip *every* car with Drew Safety Mirrors. Their cost is low, $3.50 for the regular type—$4.50 for prepayment and one-man types.

Send for Details of Free 60-day Test on your property

The experience of over 400 roads makes us confident that you can make the same gratifying savings on your property. Earlier action means earlier enjoyment of the savings. Send car specifications for trial mirrors—so that you can be the judge.

Drew Electric & Mfg. Co.

Office and Works, Indianapolis, Ind.

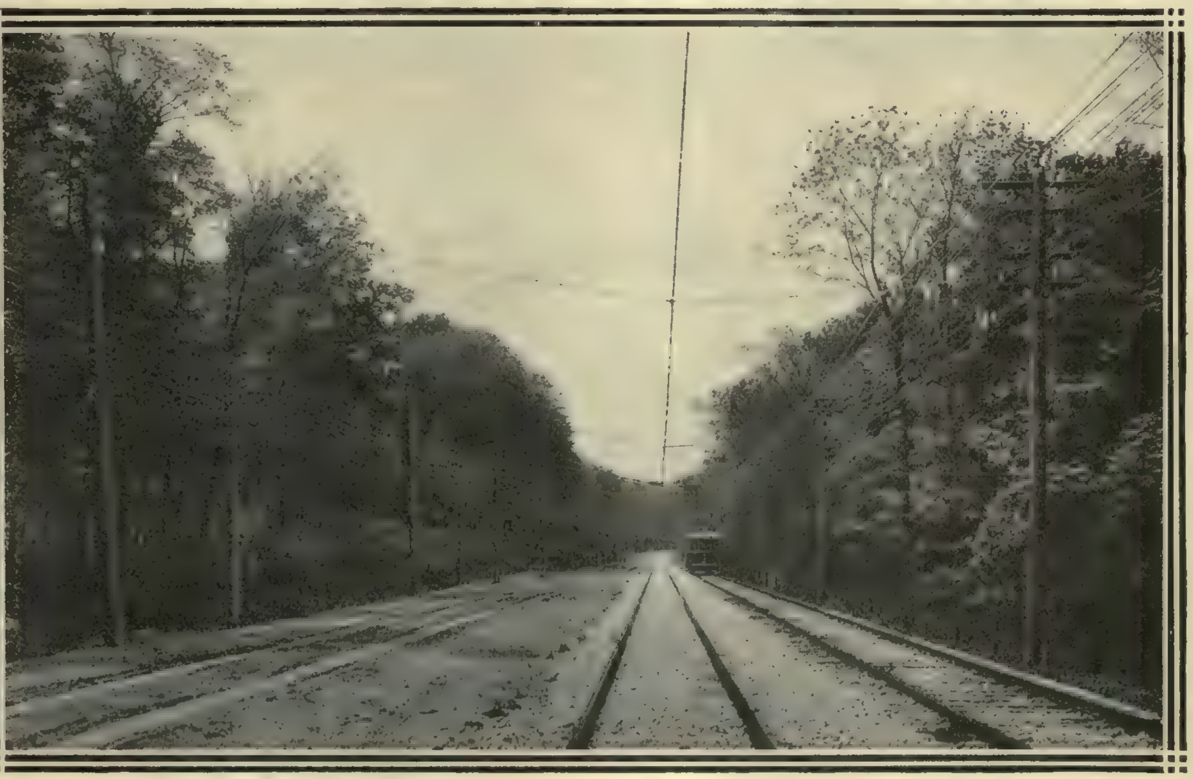
District Representatives in Principal Cities

DREW OVERHEAD LINE MATERIAL IS STANDARD ON KEENLY MANAGED ROADS. GET QUOTATIONS

15 Years and Still Good

Northern White Cedar Poles

Chicago & Joliet Railway



These Northern White Cedar Poles on the Chicago division of the Chicago & Joliet Railway have stood the tug and strain for over 15 years.

They are in good condition. The Company expects to get from 5 to 10 years more of service from them.

Many instances like this can be cited showing the long life of *Northern White Cedar Poles* under a variety of atmospheric and soil conditions.

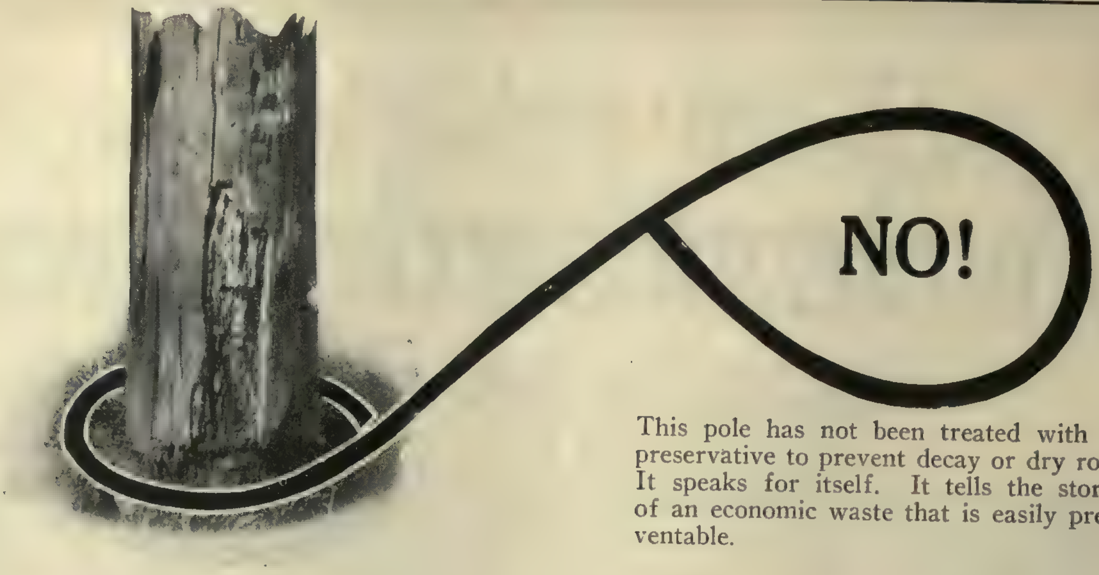
Actual experience beats finely spun language when it comes to answering that important question: "How long will they last?" You know from the records being made by Northern White Cedar Poles what may be expected of them.

Why Experiment When You Can Just as Well Play Safe? Specify Northern White Cedar Poles

The Sturdy Attractive Line

Northern White Cedar Association

Lumber Exchange **Minneapolis, Minn.**



This pole has not been treated with a preservative to prevent decay or dry rot. It speaks for itself. It tells the story of an economic waste that is easily preventable.

This pole has been treated with a Wood Preservative. It has been in service longer and under more severe service conditions than the pole shown above. It tells the tale of long service, no replacement, no labor or maintenance expense.

The Spot Test

You can easily detect impurities in a coal-tar preservative by placing a few drops on clean white blotting paper. The impurities gather in a spot in the center and in a short time their presence is clearly defined in a distinct zone. Try this test: Remember that these impurities are of no value, that they are a hindrance to the action of the preservative, that they represent a high percentage of cost from which you get no return. Try this test on the Reilly Preservative.

REILLY

Improved Wood Preservative

for open tank and brush treatment

This preservative enters into the very fibers of the wood and there it stays. The purity of the Reilly Improved Wood Preservative insures its effectiveness, stability and permanence. This preservative makes positive the long service life of Poles, Cross Arms, Ties and Structural Timbers.

We can furnish this specially treated standard timber or any treated special material on short notice. Reilly Improved Wood Preservative can be supplied in any quantity from a gallon to a carload.

Let us know your problem. We can supply valuable information to help you in its solution.

"It Stays in the Wood"

REPUBLIC CREOSOTING CO.

Indianapolis, Ind.

Plants: Indianapolis Mobile Minneapolis Seattle

Save 40% and Better

Copper for Conductivity
Steel for Strength

Aristos "Copperweld"

Copper Clad Steel Wire

for both

There are several reasons why

"COPPERWELD"

will save you 40% and more in wire cost and maintenance

—an actual saving that you can figure in dollars and cents. But there's another saving—one that can't be counted in money but that's worth a great deal more in the end—that's a satisfied Public. Another result of "Copperweld" reliability of service.

Western Sales Office:
Steel Sales Corporation
Chicago, Illinois

Eastern Sales Office:
Page Woven Wire Fence Co.
30 Church St., New York

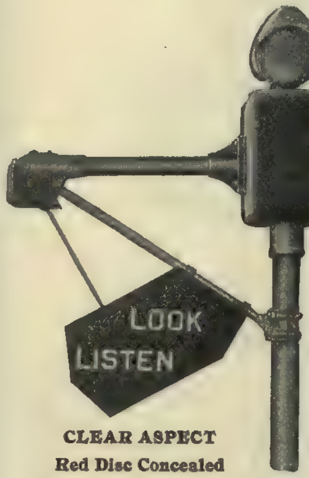
Made from the product of COPPER CLAD STEEL CO., Pittsburgh, Pa.
Drawn and Sold Exclusively by

PAGE WOVEN WIRE FENCE COMPANY

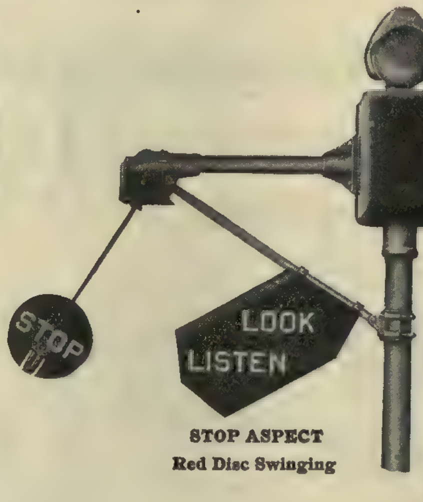
MONESSEN, PA.

Union Three Aspect Flagman

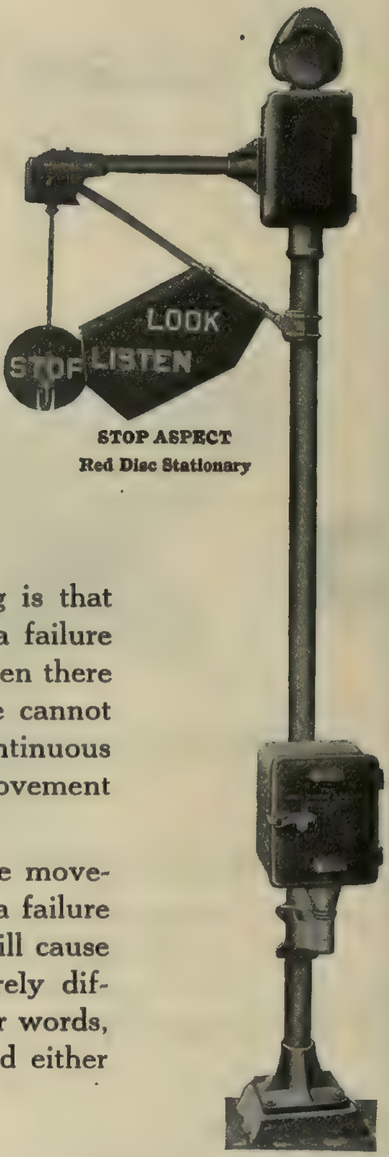
Style "DW"



CLEAR ASPECT
Red Disc Concealed



STOP ASPECT
Red Disc Swinging



STOP ASPECT
Red Disc Stationary

The most important principle in railway signaling is that which requires a signal to indicate stop when there is a failure of any part of the apparatus to function properly, or when there is an interruption of the power supply. This principle cannot be embodied in a signal indicating stop solely by the continuous movement of a disc or arm, because when such movement ceases for any reason the stop indication will be lost.

This signal, while displaying stop indication by the movement of a disc in normal operation, is so designed that a failure of any part of the apparatus or the absence of power will cause a second or emergency stop indication, which is entirely different and distinct from the proceed indication. In other words, this signal has three aspects, one indicating proceed and either of the other two indicating stop.

For additional information see Bulletin 86.

The Union Switch & Signal Co.

SWISSVALE, PA.

Trade Mark

Hudson Terminal Bldg.
NEW YORK

Peoples Gas Bldg.
CHICAGO

Canadian Express Bldg.
MONTREAL

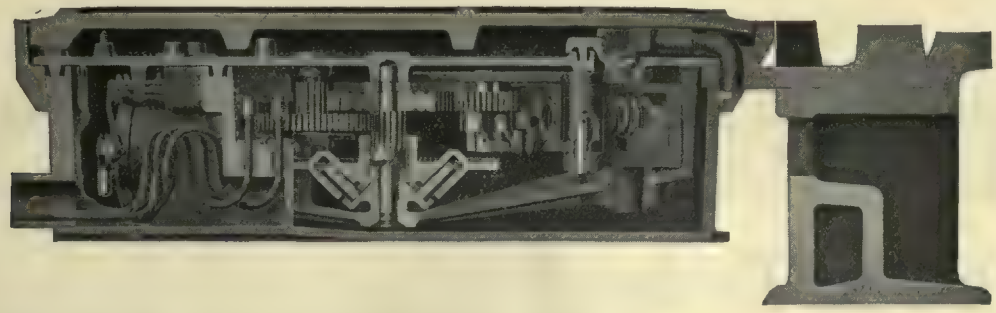
Candler Annex
ATLANTA

Railway Exchange Bldg.
ST. LOUIS MO.

Pacific Bldg.
SAN FRANCISCO

Trade Mark

Represented by the GENERAL ELECTRIC CO. in Australasia, South Africa and Argentina



What track switch will you buy anyway?

If you have in mind saving trouble for yourself you'll buy the Collins Non-Splitting Electric Track Switch because

It will prevent damage suits or trouble due to splashing when points are thrown.

It will prevent switch being thrown between trucks by a following movement under contactor.

It will prevent straddling through a most positive anti-straddling device.

If you have in mind saving time and money—the Collins is the only method of securing these desirable qualities.

It will save the trouble that follows an improperly made pipe joint or gasket.

It will save time on inspection because the entire mechanism can be lifted out of street box without making any disconnections.

It will save time on installation because the small contactors are easily mounted on standard ears.

It will save burnouts, which other electric switches are liable to, due to car standing under contactor for indefinite time.

And it's easier to work with 110 volts so that's what is used in the Collins.

Knowing this — do you want a switch **without** such qualifications?

United States Electric Signal Company

West Newton, Massachusetts

Representatives:

Western: Frank F. Bodler, Monadnock Bldg., San Francisco
W. F. McKenney, 54 First St., Portland, Ore.
Chicago: Warren Moore Osborn, McCormick Bldg.
Foreign: Forest City Electric Service Supply Company, Salford, Eng.

The ELRECO Tubular Pole

—the Pole of Least Maintenance and Replacement

The cylindrical form of Elreco Tubular Poles, which makes them lowest in first cost, also makes them lowest in maintenance cost.

The committee on Power Distribution of A. E. R. A., after a thorough investigation, recommended the use of the Tubular Steel Pole. This is the only form of steel pole ever recommended by this committee. The record of simplicity, ease of handling, reliability and durability of Elreco Poles over a period of twenty-five years was reflected in this recommendation.

All steel products must necessarily be protected from corrosion. This is true of steel poles, and time has proved that Tubular Steel Poles are the least affected by action of the air and moisture and are most accessible for painting.

Elreco Poles have no angles or pockets to retain moisture, and no corners that are accessible to corrosion. Therefore, they are less subject to the ill effect of corrosion than are structural steel poles. Owing to the tubular shape any Elreco Pole can be furnished with protecting sleeve, which provides double thickness of metal at the ground line.

It is evident that the pole least susceptible to corrosion will give the longest life—The ELRECO has that record.

ELRECO Tubular Poles

Combine

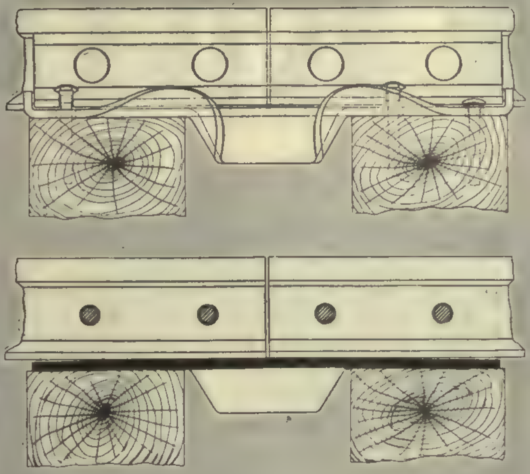
Lowest Cost
Lightest Weight
Least Maintenance
Greatest Adaptability

Electric Railway Equipment Co.

Cincinnati, Ohio
New York: 30 Church Street

Don't overlook this feature of

Abbott Rail-Joint Plates



THAT slight camber (exaggerated in the sketch) makes the rail ends bear first and bring the joint plate into action. Then as the wheel load approaches closer, the joint plate yields just enough to come into full flat bearing with the rail base and gives the weak part of the joint the entire support of the two joint ties.

This support, made stronger by the flanging on the plate, takes the downward stress off the angle bars, and therefore protects them from wearing, bending or taking a permanent set. For this reason also all tendency to stretch the bolts and to loosen the nuts is avoided.

It provides a base support to the rail ends without clamping the flanges or making the joint too rigid, and leaves perfect freedom for wave motion of the rails.

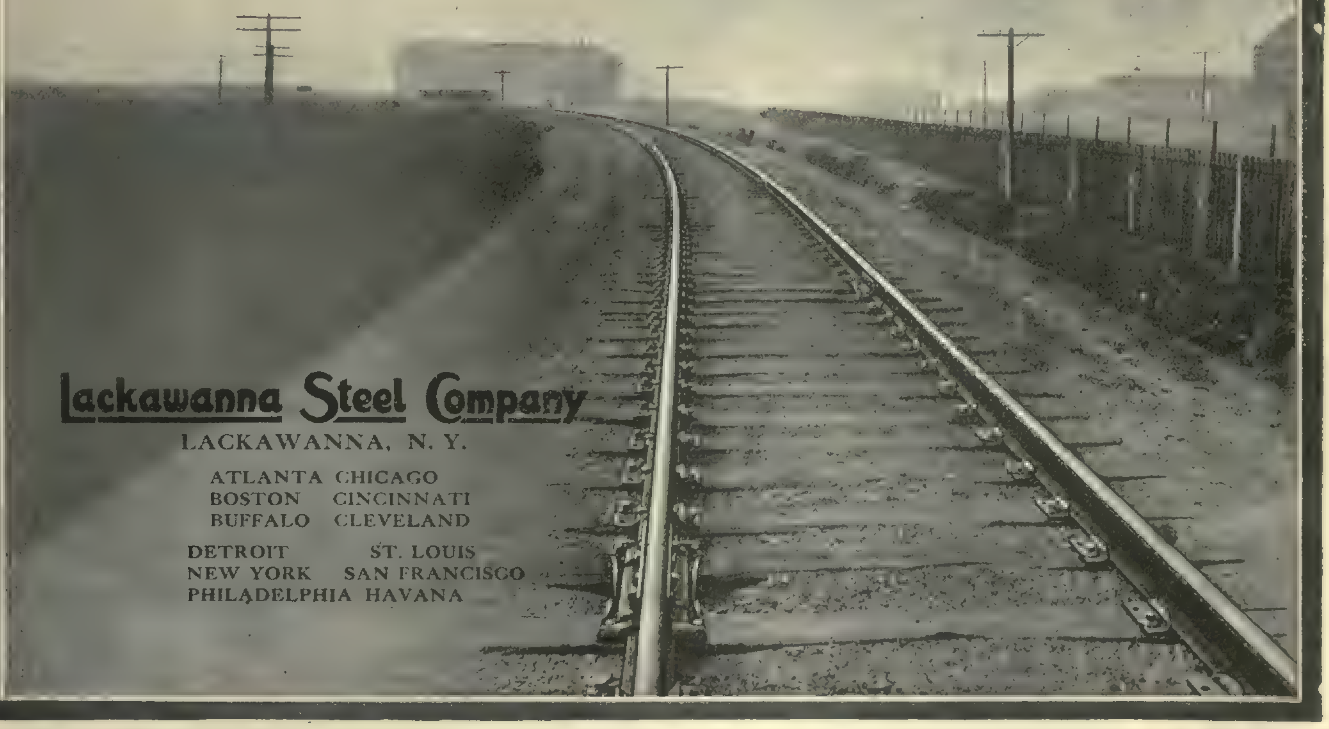
Tests on Abbott-Plated track have shown perfect alignment and smooth-running track surface after five years of service.

Ask our engineers to explain other desirable features.

Ask for our booklet
"Improved Track Appliances"

289

The ABBOTT RAIL JOINT PLATE
"BUILT LIKE A BRIDGE"



Lackawanna Steel Company

LACKAWANNA, N. Y.

ATLANTA CHICAGO
BOSTON CINCINNATI
BUFFALO CLEVELAND
DETROIT ST. LOUIS
NEW YORK SAN FRANCISCO
PHILADELPHIA HAVANA

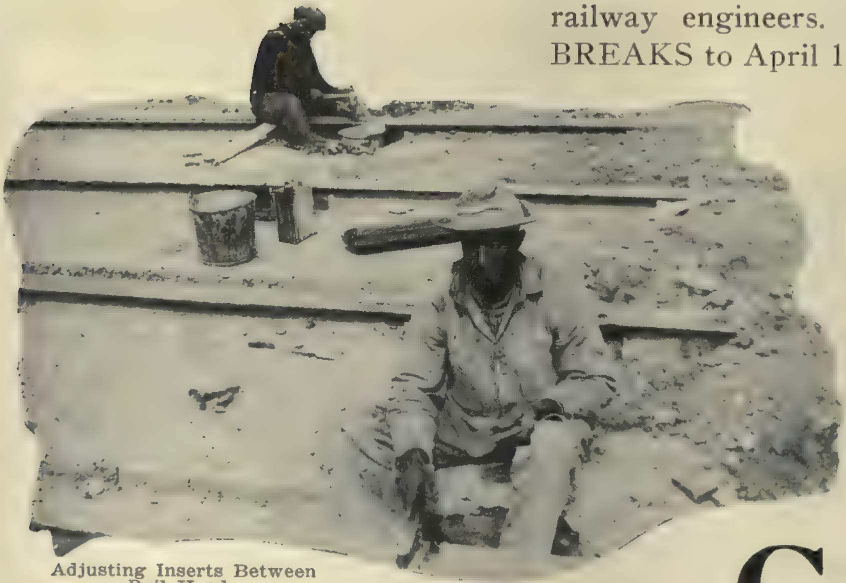
The Plain Facts From Dallas

THERMIT

303 Thermit Welds—Began Jan. 3/16, ended May 1/16. Commerce St. from Houston & Texas Central Railroad to Exposition Av. 103 lb. Lorain 478, concrete sub-base, International steel twin ties. **One break,** was reported to April 11, 1917, and this was in the reverse curve illustrated.

Commerce Street, Dallas, Texas

102 Thermit Welds—Began July 13/15, ended Oct. 1/15—Bowen St. from McKinney Ave. to Cedar Springs—80 lb. Lorain 337 rail 6 in. ballast under ties and concrete paving base. Part of line on sharp curves, part on 6 per cent grade; night work and first Thermit experience for railway engineers. In spite of these handicaps, NO BREAKS to April 11, 1917.



Adjusting Inserts Between Rail Heads

The Service Records of

THERMIT
INSERT WELDS

can bear Publicity because of their Unsurpassable Efficiency.

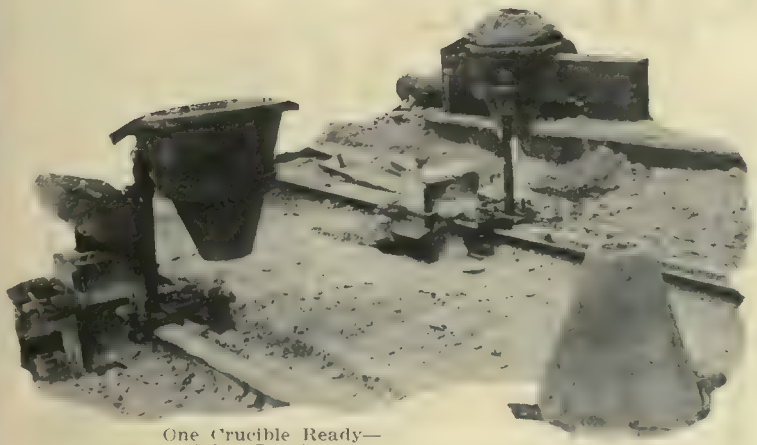
Goldschmidt

120 Broadway

329-333 Folsom Street, San Francisco **7300 So. Chicag**

About 509 Straight

WELDS

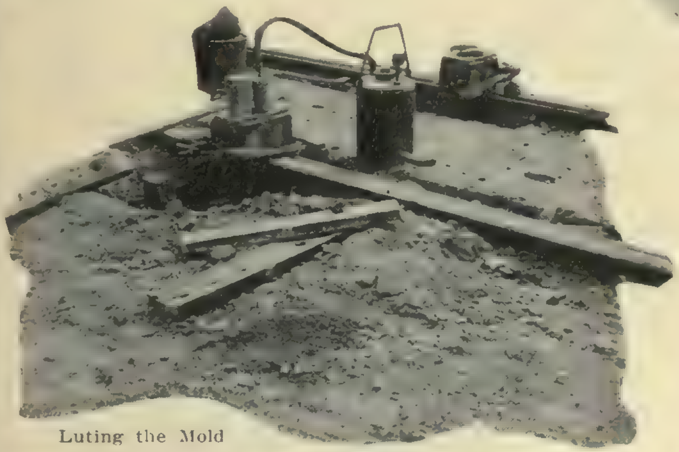


One Crucible Ready—
Other Pouring

23 Thermit Welds—Began Nov. 11/15, ended Feb. 15/16—Peak St. from Main St. to Elm St.—103 lb. rail and substructure as above. This track carries heavy interurban cars. NO BREAKS were reported to April 11, 1917.

81 Thermit Welds—Began Aug. 24/15, ended Nov. 27/15—Lamar St. from Texas & Pacific Railroad to McKinney Ave.—103 lb. Lorain 426 rail, remainder like Bowen St. Day work under difficult conditions. NO BREAKS were reported to April 11, 1917.

Pouring



Luting the Mold

About 50 Thermit Compromise Welds—Compromise welds, of course, offer unusual difficulties in installation and service so that the efficiency achieved in straight Thermit welding is not to be expected. This job carried out during August and September, 1916, included Thermit welding of 80-lb. T and of 103-lb. No. 426 grooved rail to 127-lb. No. 397 guard section.

The seven breaks reported up to April 11, 1917, are ascribed partly to faulty work and partly to expansion. All breaks were in the T-rail compromises.

Thermit Co.

ew York

venue, Chicago **103 Richmond Street West, Toronto, Ont.**

For your

LINE O' TRACK

use

TRACKOLINE

About the hardest place in the world to keep arid are the Tropics. Vegetation there springs up almost overnight and still here's a

TRACKOLINE (KILLS EVERY WEED TOP ROOT & SEED) **EQUIPMENT**

that's doing wonderful work in the Tropics on a Panama Railroad.

If TRACKOLINE can successfully combat that kind of insistent vegetation what will it do for your tracks.

You should prepare for the summer now. Don't give the weeds a head-start. Don't wait until they come up to kill them. Don't let them come up at all.

Every barrel of TRACKOLINE means a mile of clean track.

TRACKOLINE **cleaned**

Fill out the Coupon
Let us tell you
"Facts About
Clean Tracks"

Protective Materials Corp.,
Vanderbilt Bldg.,
New York

Please tell me how to prevent weed-growth this summer. Send your bulletin—"Facts About Clean Tracks."

Name ....

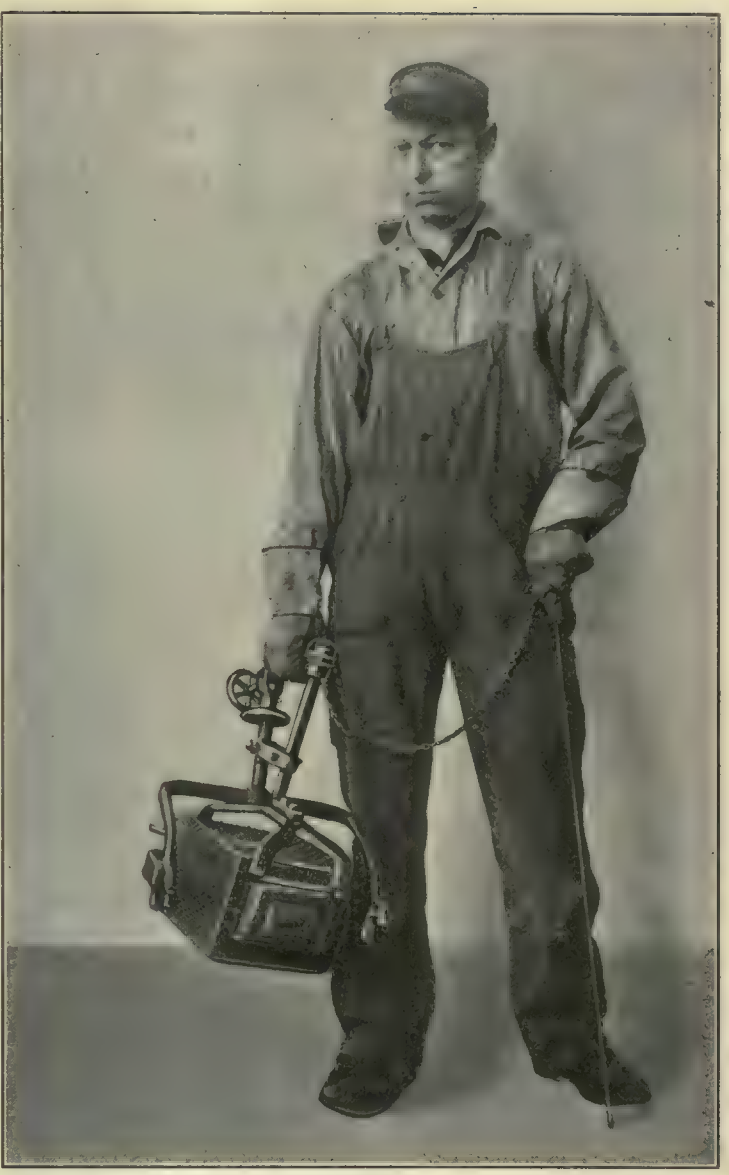
Address ....

Protective Materials Corp.
Vanderbilt Bldg., 51 East 42d St., New York

You can see
that the

ERICO
Portable
Welder

really is
portable

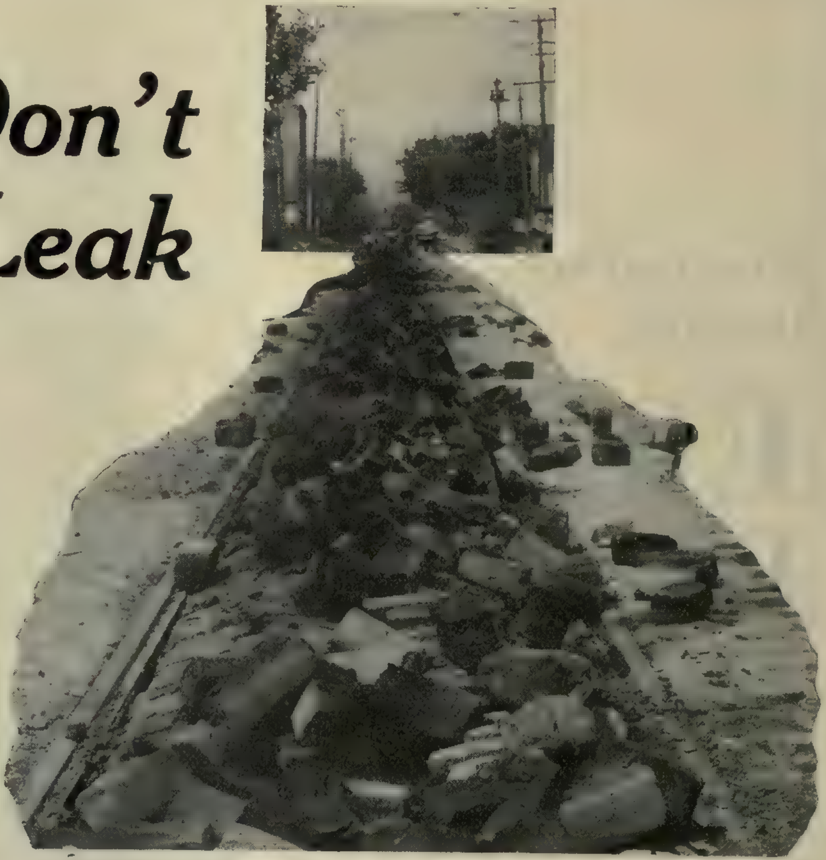


One reason why one man, if necessary, can apply Erico Bonds, is that the business element of the Portable Welder—the electric furnace—weighs less than 65 lb. No trouble to install that weight on the rail. While your man is welding, the rheostat of the Portable Welder, mounted in a suitable manner, stands on one side until he is ready to move the whole outfit to the next bonding point.

ERICO
THE LINE OF LEAST RESISTANCE

The Electric Railway
Improvement Co.
Cleveland

If You Don't Stop the Leak



—You Will Have to Stem the Flood

Rail corrugations and bad joints are similar to the famous "leak in the dyke"—they are comparatively trifling in importance at the beginning, but unless prompt measures are taken they rapidly develop serious and far-reaching effects.

These incipient defects in rails are like the first little spot of decay in a tooth. If the dentist is permitted to get busy *right away* the progress of decay is stopped.

In the same way if a

Reciprocating Track Grinder

is put to work promptly upon the early appearance of corrugations or cupped joints it means a big eventual saving in time and cost of grinding and eliminates the necessity of grinding away so much of the wearing surface of the rail as would be necessary if the indentations are allowed to become deep.

And don't forget that merely because track is new is no sign that these "leaks" in track efficiency will not develop. It has been clearly shown that serious corrugation may show in track which has not been in service a month.

Trying to save expense by delaying track grinding until it becomes an absolute necessity is like trying to save money and trouble by delaying a visit to the dentist until the tooth begins to ache.

We are ready to prove the efficiency of Reciprocating Track Grinders on your own tracks without any risk to you.

Railway Track-work Co.

30th and Walnut Sts., Philadelphia

Demon "Rust" and his aids "Settling" and "Sliding" have no terrors for

"ARMCO" IRON CULVERTS

The highest known degree of PURITY has been attained in the iron which goes to make these culverts. In it, the rust-producing action between unlike metals has been almost entirely eliminated. That's why "Armco" Iron Corrugated Culverts can be exposed to the weather and the soil through a long lifetime of service.

The strength of the corrugated construction and the overlapping and interlocking joints very largely protects them from injury by settling and shifting fills.

Floods cannot injure them, even though the embankment is washed away. Removal and relocation can be accomplished with little trouble and no loss.

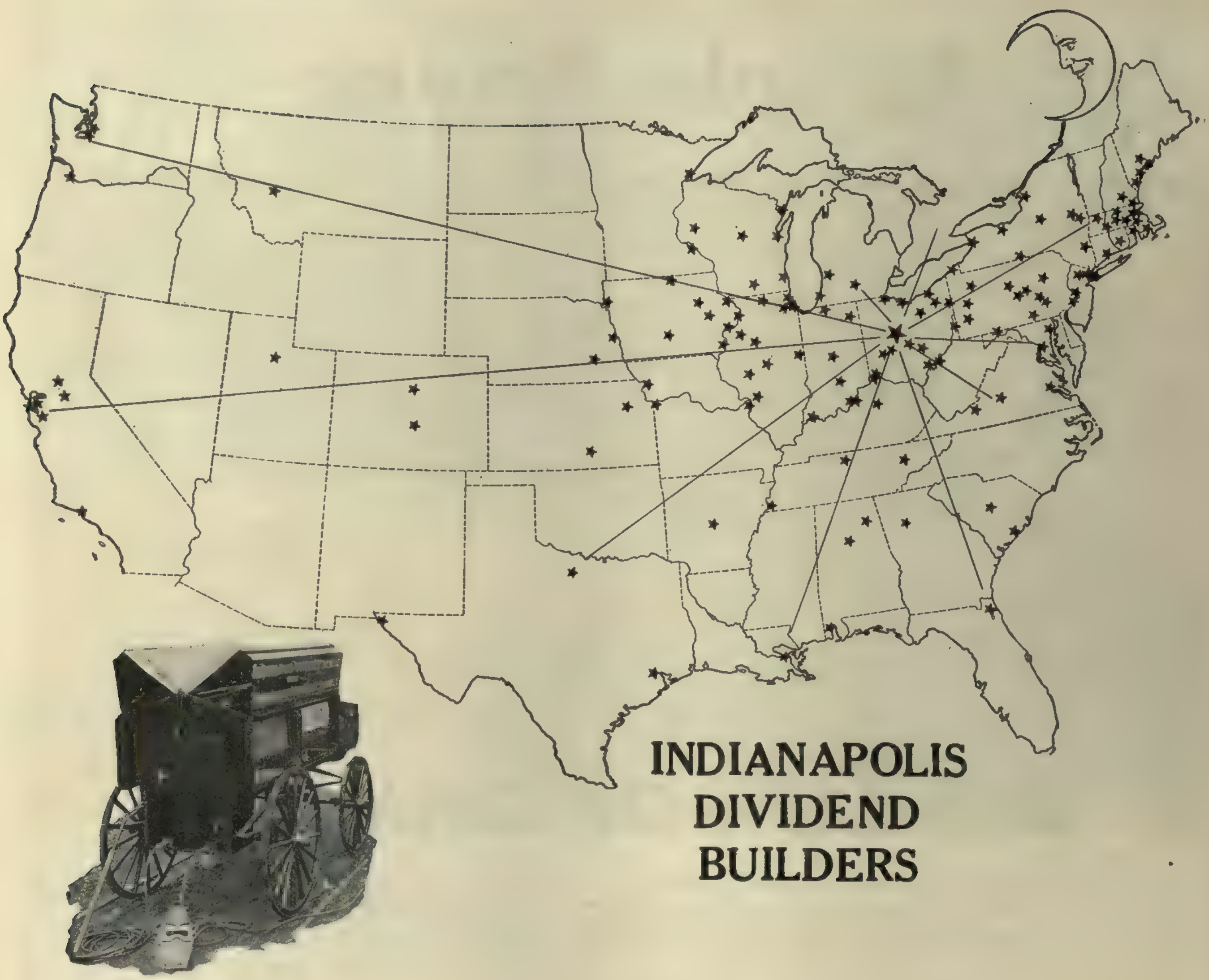
If you're contemplating new work or relocation investigate "Armco."

AMERICAN ARMCO INGOT IRON

Write or phone the nearest manufacturer for full information as to "Armco" Iron Culverts, Siphons, Flumes, Sheets, Roofing, and Formed Products.

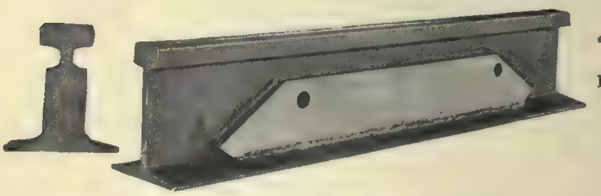
Arkansas, Little Rock
Dixie Culvert & Metal Co.
California, Los Angeles
California Cor. Culvert Co.
California, West Berkeley
California Cor. Culvert Co.
Colorado, Denver
R. Hardesty Mfg. Co.
Delaware, Clayton
Delaware Metal Culvert Co.
Florida, Jacksonville
Dixie Culvert & Metal Co.
Georgia, Atlanta
Dixie Culvert & Metal Co.
Illinois, Springfield
Illinois Corrugated Metal Co.
Indiana, Crawfordsville
W. Q. O'Neall Co.
Iowa, Des Moines
Iowa Pure Iron Culvert Co.
Iowa, Independence
Independence Culvert Co.
Kansas, Topeka
The Road Supply & Metal Co.
Kentucky, Louisville
Kentucky Culvert Co.
Louisiana, New Orleans
Dixie Culvert & Metal Co.
Maryland, Munsey Bldg., Baltimore
Wm. M. Baker.
Massachusetts, Palmer
New England Metal Cul. Co.
Michigan, Bark River
Bark River Bridge & Cul. Co.
Michigan, Lansing
Michigan Bridge & Pipe Co.
Minnesota, Minneapolis
Lyle Corrugated Culvert Co.
Minnesota, Lyle
Lyle Corrugated Culvert Co.
Missouri, Moberly
Corrugated Culvert Co.
Montana, Missoula
Montana Culvert & Flume Co.
Nebraska, Lincoln
Lee-Arnett Co.
Nebraska, Wahoo
Nebraska Culvert & Mfg. Co.
Nevada, Reno
Nevada Metal Mfg. Co.
New Hampshire, Nashua
North-East Metal Culvert Co.
New Jersey, Flemington
Pennsylvania Metal Culvert Co.
New York, Auburn
Pennsylvania Metal Culvert Co.
North Dakota, Wahpeton
Northwestern Sheet & Iron Wks.
Ohio, Middletown
The Ohio Corrugated Culvert Co.
American Rolling Mill Co.
Oklahoma, Shawnee
Dixie Culvert & Metal Co.
Oregon, Portland
Coast Culvert & Flume Co.
Pennsylvania, Warren
Pennsylvania Metal Culvert Co.
South Dakota, Sioux Falls
Sioux Falls Metal Culvert Co.
Tennessee, Nashville
Tennessee Metal Culvert Co.
Texas, Dallas
Wyatt Metal Works.
Texas, El Paso
Western Metal Mfg. Co.
Texas, Houston
Lone Star Culvert Co.
Utah, Woods Cross
Utah Corrugated Cul. & Flume Co.
Virginia, Roanoke
Virginia Metal Culvert Co.
Washington, Spokane
Spokane Cor. Culvert & Tank Co.
Wisconsin, Eau Claire
Bark River Bridge & Culvert Co.

Canada—Canada Ingot Iron Co., Ltd., Guelph, Sherbrooke, Winnipeg, Calgary



INDIANAPOLIS DIVIDEND BUILDERS

In former years only the stars of greater magnitude (the larger electric railways with ample resources and extensive mileage) were able to operate with greatest economy and least maintenance thru having continuous welded track, eliminating bad bonds, pounding joints, paving renewals and other maintenance expense, but since the advent of the Indianapolis welder and welded joints the planets or stars of lesser magnitude have appeared in the constellation of the Golden Way, losses have been converted into earnings and golden dividends have been distributed to the stock holders. It is estimated that over $2,000,000.00 annually are saved by the electric railways thru the use of Indianapolis reclamation material. Roads that are operating at a loss with bad joints can, by eliminating them, show earnings. Send for our booklet on "Conservation of Track and Roadway, or The Prevention and Cure of Track Disease."



"Simplex" Joint for High Tee Rail

"Apex" Joint: Supporting Head on Gage Side for Guard and Girder Rail

Cupped Rail Ends, Loose Pounding Joints and Bad Bonds cause 90% of track and rolling stock maintenance.

Indianapolis Switch & Frog Company

Springfield, Ohio

Agasote Roofing

Saves a Day per Car

That's the statement made by the Superintendent of Shops of one big electric railway company.

Agasote Roofing comes to you in sheets already shaped and cut to size—ready for application.

It is consequently quickly, easily and economically applied.

It makes a big saving in time and labor.

If that were its **only** big advantage and it were merely on an equality with other roofing materials in other respects it would still be worth your serious consideration from this point alone.

But in addition Agasote

Has Great Strength
Is Absolutely Waterproof
Requires No Auxiliary Coating or Covering Such as White Lead and Canvas
Grows Stronger in Service
Makes a Cheaper Roof than Wood
Is an Absolute Non-conductor of Current
Has High Insulation Value Against Temperature
Holds Paint as Well or Better Than Wood or Steel

Those are all distinct advantages that are worth having.

The Pantasote Co.

Manufacturers also of Pantasote—the most widely used and highly standardized railway car curtain material on the market

11 Broadway, New York
People's Gas Bldg., Chicago, Ill.
797 Monadnock Bldg., San Francisco, Cal.

On the job at Portland, Ore.

"D & W" PRODUCTS
for
Wire Wound or Ribbon Wound Fields

The Portland Railway, Light & Power Company, Portland, Ore., has always kept in close touch with the best railway motor practice. That's one reason why it uses Deltabeston wire for rewinding the wire-wound field coils of its No. 58 motors.

If you have similar motors in service you can prolong their efficient usefulness by using

Deltabeston Magnet Wire

In the case of motors with ribbon-wound fields, rewind the fields and insulate the terminals with

Delta Tape and Delta Sheeting

The reliability and output of your motor depend upon their ability to resist heat.

D & W Products resist heat best.

Let us confer on the settlement of your motor troubles.

DELTABESTON WIRE REG. U.S. PAT. OFF.

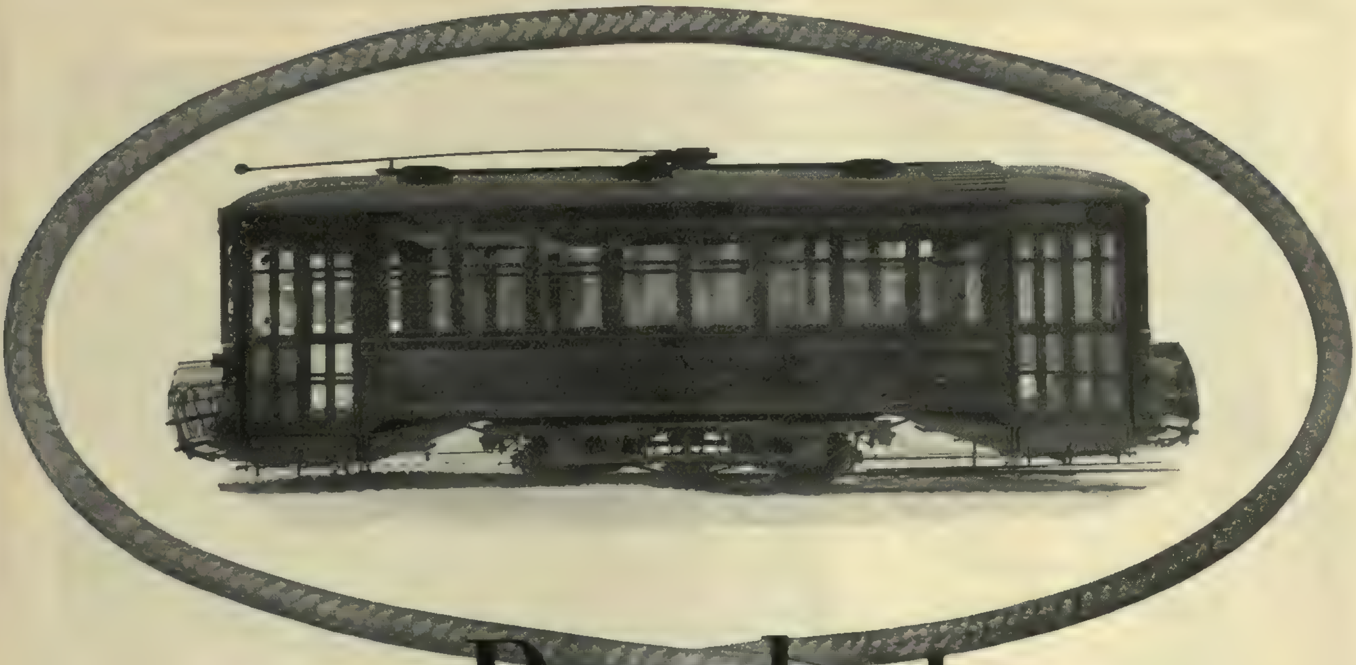
D & W FUSE CO.

Providence, R. I.

D&W REG. U.S. PAT. OFF.

New York Representative: A. Hall Berry, 97 Warren St., New York

Agents—Pettingell-Andrews Company **Western Electric Company** **Central Electric Company**



Duraduct

Reg. U. S. Pat. Off.

for the
Fonda, Johnstown & Gloversville Railroad

The Fonda, Johnstown & Gloversville Railroad is another addition to users of Duraduct for car wiring. It has recently applied this modern conduit in $1\frac{1}{4}$ in. and $1\frac{1}{2}$ in. sizes to carry and protect the main motor and magnetic brake circuits of a number of cars including the thoroughly up-to-date specimen pictured. The best conduit belongs on the best cars!

Whether your cars are new or old, open or closed, composite or steel, you can make use of Duraduct to advantage if these are the qualifications you demand of car conduit.

No Elbows
No Threading
Non-raveling
Non-blistering
Non-collapsible
Tough
Flexible
Fireproof
Waterproof
Easy to fish
Light as a Feather

Approved by the Underwriters' Laboratories

Sample on Request

TUBULAR WOVEN FABRIC COMPANY
MANUFACTURERS —— PAWTUCKET, R. I.
GENERAL SALES AGENT — A. HALL BERRY
97 WARREN ST. NEW YORK —— 9 SO. CLINTON ST. CHICAGO.

Northern Electric Company LIMITED Distributors for Canada

Nevasplit Headlinings on New Single End Pittsburgh Cars

Specifications
Panels and Headlinings

All panels and headlinings must be clear and free from knots, soft spots or sap. Surfaces absolutely uniform in hardness and perfectly smooth. Must be as strong crosswise as lengthwise, and every panel must be proof against "splitting" or bulging under the most severe conditions of wear and weather.

Up to Specifications
in Every Way

Nevasplit Headlinings

even go beyond requirements. They are long wearing. They never crack, due to the peculiar method of construction. They are made of thousands of tissue-like layers mechanically locked together. No glued laminations to open.

Nevasplit linings are absolutely waterproof, non-warping, non-peeling, non-fading, sightly and economical. They are high in resistance to heat or cold.

THE KEYES PRODUCTS COMPANY

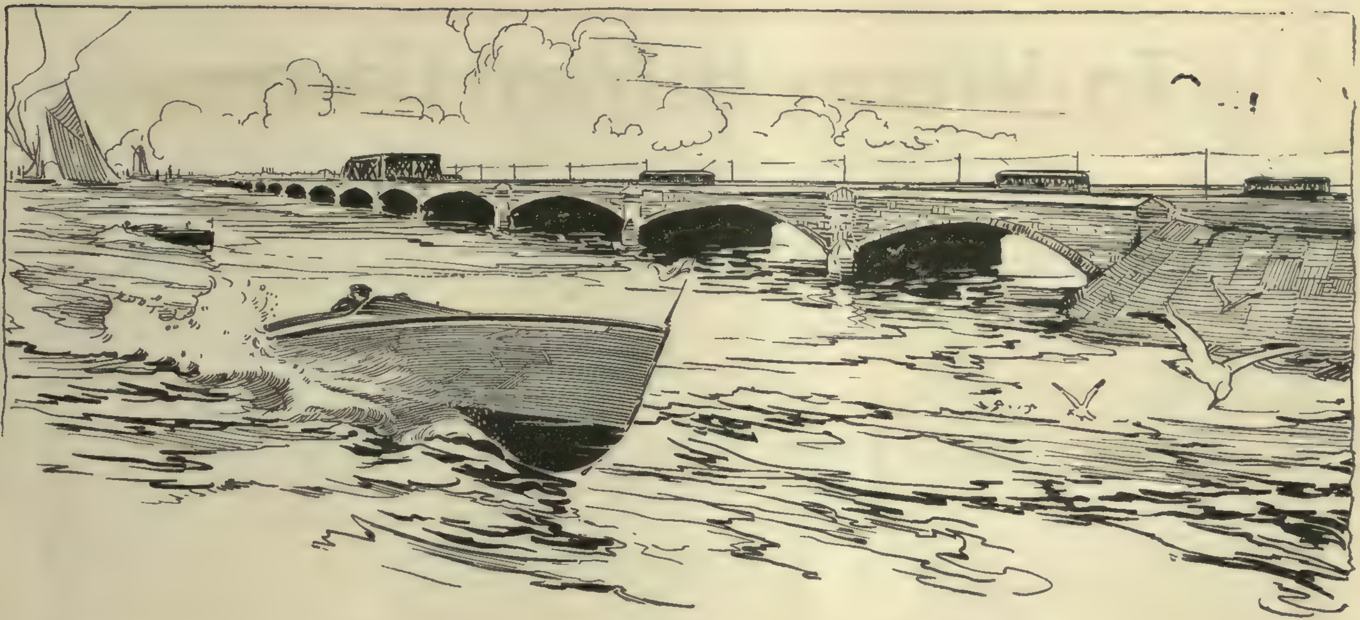
120 BROADWAY, NEW YORK

NEW YORK
W. R. Kerschner Co., Inc.
50 Church St.

CHICAGO
J. E. Simons
Fisher Bldg.

ITALY
American Traffic Co.
Via Capuccini, #4, Milano, Italy

SAN FRANCISCO
Ford & Geirrine
Merchants Exchange Bldg.



Rico Coasting Recorders

are on Every Car Speeding over the Houston-Galveston Causeway

You can't hold those Texans down—tidal wave or no tidal wave!

The great flood only made Galvestonians hustle harder than ever, while inland Houston actually has built a canal in order to become a port.

Naturally the interurban railroad connecting two such cities has to be a good one. It was built and is operated by Stone & Webster.

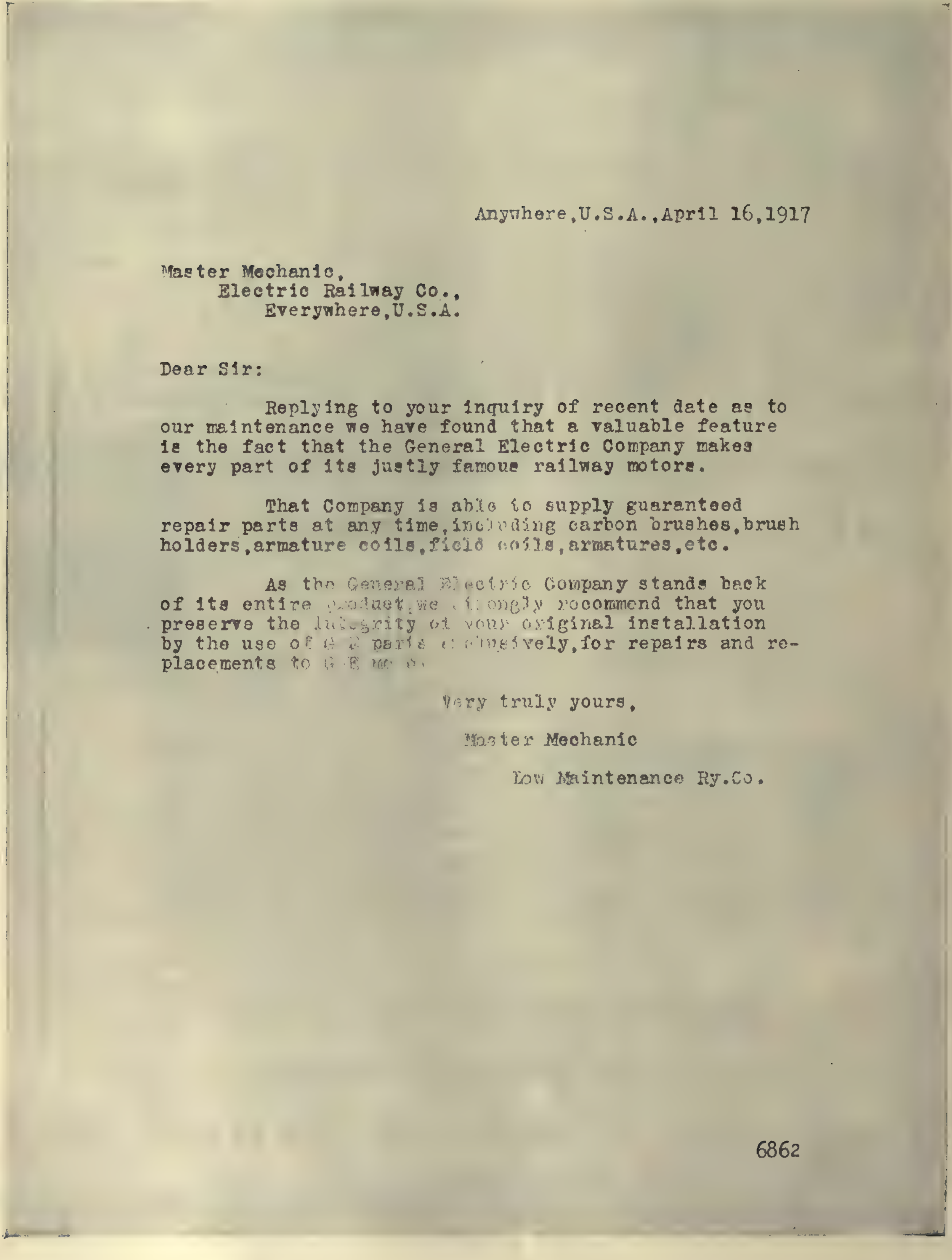
The Houston-Galveston Interurban Railway is a good one; and, besides, every car on this fast interurban carries a Rico Coasting Recorder. The embodiment of

The True Principle for Measuring Operating Efficiency

Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. 61 BROADWAY, NEW YORK

"To Whom It May Concern":



Anywhere, U.S.A., April 16, 1917

Master Mechanic,
Electric Railway Co.,
Everywhere, U.S.A.

Dear Sir:

Replying to your inquiry of recent date as to our maintenance we have found that a valuable feature is the fact that the General Electric Company makes every part of its justly famous railway motors.

That Company is able to supply guaranteed repair parts at any time, including carbon brushes, brush holders, armature coils, field coils, armatures, etc.

As the General Electric Company stands back of its entire product, we strongly recommend that you preserve the integrity of your original installation by the use of G-E parts exclusively, for repairs and replacements to G-E motors.

Very truly yours,

Master Mechanic

Low Maintenance Ry. Co.

6862

Electric Railway Journal

Published by the McGraw-Hill Publishing Company, Inc.
Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIX NEW YORK, SATURDAY, MAY 5, 1917 Number 18

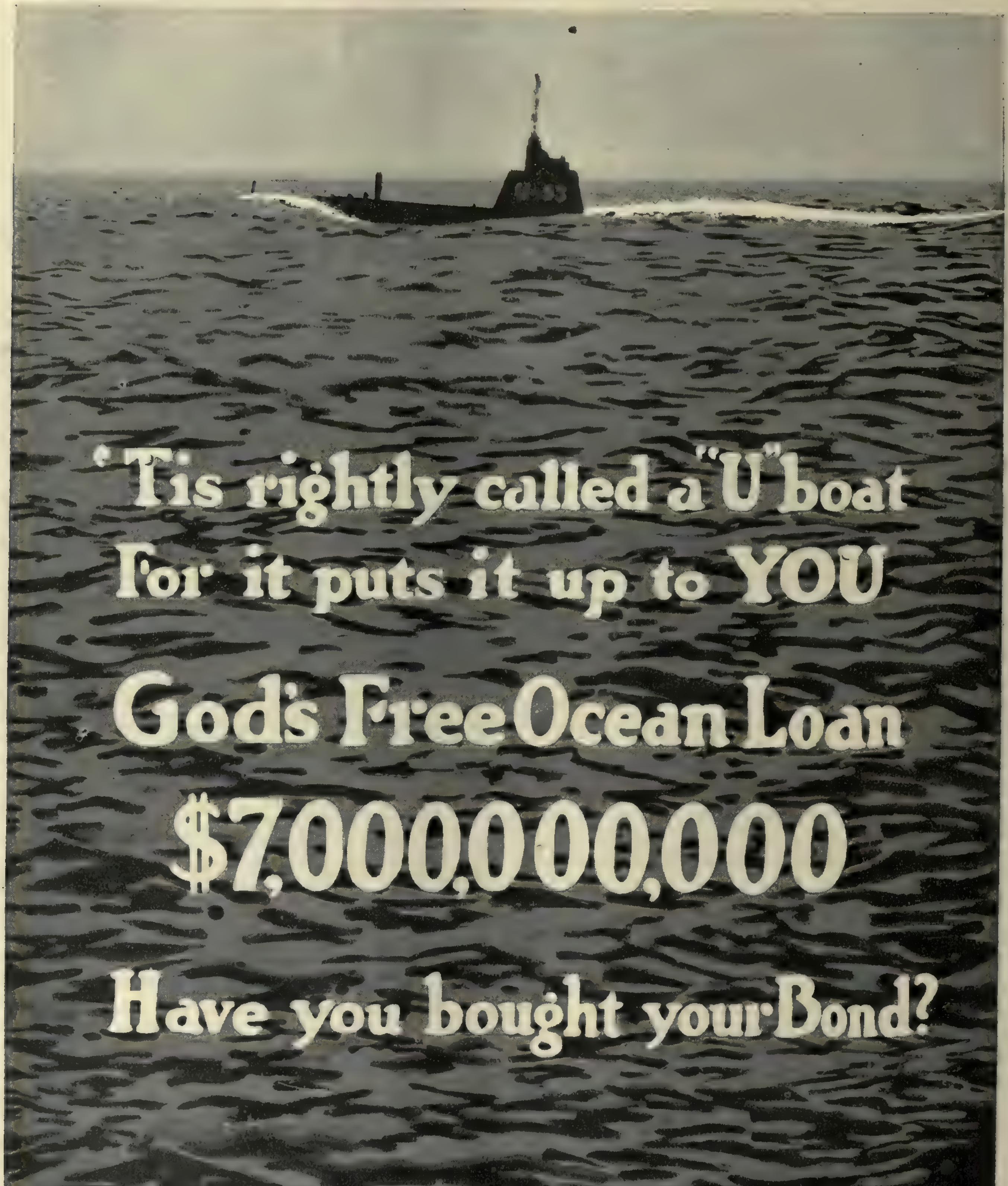
RAILWAYS CAN HELP SELL NEW BONDS One of the large public utility holding companies has empowered each of its subsidiaries to supply information to its public in regard to the new government loan and to receive and handle subscriptions for this loan without charge and without profit. This is a patriotic act and is one which many electric railway companies, especially those in the smaller communities which are without banking facilities, could do with benefit both to the government and to the people in the communities through which they run. Secretary McAdoo has announced that the details for utilizing the service of these outside agencies in securing an extended sale of these bonds are being worked out and will be made public later. Other electric railway companies which do not have the facilities for handling subscriptions could advertise the bonds in their waiting stations and on their cars. To secure this being done in the most effective way, an offer has been made to the Secretary of the Treasury in behalf of the national street-car advertising operators of free card space to advertise the bonds or for any other purpose which he may desire. Owing to the size of the first issue, $2,000,000,000, the loan must be a popular one and this means that every facility should be offered so that subscriptions can be made easily.

"HAVE YOU BOUGHT YOUR BOND?" The American people are not as familiar with government loans as are the people abroad. This is partly because of the small amount of government debt outstanding, partly because in our developing country there have been many other opportunities for investment and partly because many of the earlier government loans formed the basis for the issue of banknotes and thus were held largely by the banks. Nevertheless, the conditions surrounding this loan, such as exemption from federal and state taxation, except estate and inheritance taxes, and the privilege of conversion into bonds bearing a higher rate of interest, if the government issues any such bonds during the present war, make it a very attractive one. Our cartoon on page 812 emphasizes the reason for the loan. The question which it asks is, "Have you bought your bond?" This is a question which every patron of an electric railway as well as every individual connected with an electric railway company should be able to answer affirmatively in the near future or to give a good reason for not having done so. In such cases, employing companies, whether railway or manufacturing, may offer to assist by making advances to the employee to be repaid gradually by deductions from wages or salary payments. This practice was followed by a great many British firms in connection with the recent large British loan and appears to have been of great assistance. This war will have to be won quite as much by bank checks as by bullets, and it is the duty of all to help.

BETTER MEDICAL RELATIONS Better public relations are not created solely by newspaper advertising, by courteous office boys and attentive officials, by car posters or what not. They are the result of frankness, sincerity, truth and understanding in all phases of a corporation's life. Take, for example, the medical side of an electric railway. That does not mean much to the average citizen, but it can be made a powerful aid in improving relations with patrons and employees. This week Dr. Holtz describes in our columns what the Associated Bureaus of the Pittsburgh Railways have accomplished along this line, and the story is most inspiring. The company has a medical code as strict as that of any practitioner; it handles its medical affairs in an open and dignified manner; it co-operates with rather than antagonizes the local physicians—and the result is a valuable asset, the good-will of the entire medical profession. In the case of the employees, the work of giving direct medical and welfare aid is handled with the same enlightened thoroughness. To bring "ambrine" from the battlefields of Europe was not a great task, but what a protective interest in the employees it manifested. When the Pennsylvania compensation law went into effect in 1916, the company did not have to make any material alterations in its medical practices—the act had been anticipated by many months! These are merely incidents, but they are typical. The Associated Bureaus of the Pittsburgh Railways are building their house upon the rock of better public relations, and it will stand.

REMEDYING THE COAL SITUATION From nearly every section of the country comes the complaint from public utility companies that coal is as difficult to get as in mid-winter. Some electric railway companies, profiting by the experience of the last twelve months, have taken the bull by the horns and purchased their own coal mines, but obviously this is impracticable for most electric railways. It is to be hoped that the ruling just issued by the special committee on national defense of the American Railway Association to give preferred movement to shipments of coal and iron ore will help in this emergency. Beginning May 1 all railroads handling, loading and distrib-

The Nation Needs Money


'Tis rightly called a "U" boat
For it puts it up to YOU
God's Free Ocean Loan
$7,000,000,000
Have you bought your Bond?

Suggestive Thoughts on This Cartoon Will Be Found in the Editorials on the Previous Page Entitled "Railways Can Help Sell New Bonds" and "Have You Bought Your Bond?"

uting gondola and hopper cars are admonished to observe this rule, and the committee will look to the president of each road personally to see that this order is not evaded or abused. This act and the proposed horizontal increase in freight rates will probably do more to improve the steam railroad freight situation than any of the many other remedies that have been proposed. So far the proposed freight rate increases have not included coal, coke and iron ore. But it is not improbable that in the early future the tariffs on these commodities will be considered for increase on the basis of so many cents per ton. The possibility of any new factor which will increase the cost of fuel for public utility use will create another cause of worry to electric railway coal users, and particularly so because, unlike manufacturers, they are not in position to pass on the cost easily to the "ultimate consumer."

A FREAK ORDINANCE AT LOS ANGELES Los Angeles, so wide awake on other matters, allowed the passage on April 24 of an ordinance that is a prize for the ignorance it displays of electric railway operation. Section 10-a actually says: "It shall be unlawful . . . to replace or repair the rails . . . or ties . . . or to repair, replace or reconstruct the roadbed, pavement or wearing surface . . . within said business district for any such purpose, between the hours of 7 o'clock p. m. and 6 o'clock a. m." On reading the hours, anyone who is unfamiliar with the facts would naturally assume that the printer had reversed the p. m. and a. m. designations; but, no, the ordinance has been quoted correctly. Just how an electric railway can keep up its track in the busiest part of the city during the hours when the streets are congested with cars, automobiles, wagons and pedestrians, if it is not allowed to make repairs and renewals at night is something which we must leave to the councilors and Mayor in their profound wisdom. We hope that the Los Angeles and Pacific Electric Railways will find some way of exposing such stupidity. The citizen who finds Broadway or Main Street torn up in the middle of the day will doubtless excoriate the railways instead of the Council for failing to do such work when he is fast asleep in Pasadena or some other suburb. Such undeserved misunderstandings are among the many things which make an electric railway operator's life "of few days and full of trouble."

SAVINGS POSSIBLE IN THE COAL PILE The heart-breaking waste of energy between the coal pile and the wheel tread has worried electric railway economists whenever they have stopped to consider it. Heretofore, it has been an individual matter with each company, but now the importance of reducing unnecessary coal consumption has become a national question. On the average probably less than 5 per cent of the original energy gets to the place where it acts to drive the car. Much of the 95 per cent loss is inevitable, but some of it can be prevented by applying the results of engineering research. Even when the energy reaches the wheel tread it is far from the goal, for still perhaps a fifth of it is doomed to preventable waste. Furthermore, while coal is the principal element of energy production expense, the labor along the line from coal pile to wheel tread also presents elements of loss. These are difficult to evaluate in numbers, but are worthy of careful attention. In these days of enforced economy in the electric railway field it behooves us all to have firm convictions regarding the actual situation in this matter of preventable waste. The facts must somehow be brought home to the men who ultimately control the expenditure of the energy; to executives first, then to boiler and engine-room operatives, to substation attendants and finally to the men on the front car platforms, who are the "ultimate consumers." All of these men must be shown how they can contribute to a general saving, and their successful efforts in doing so must in some way be recognized and rewarded. They must all be made to feel that even if sensational results are not possible, a little saving here and there will contribute to a creditable whole. Incidentally the co-operative spirit which will be fostered by concerted effort in this direction will produce corresponding benefits in others.

ELECTRIC RAILWAY EARNINGS COMPARED

On March 31 we published figures compiled by the information bureau of the American Electric Railway Association, showing that in the calendar year 1916 electric railway revenues displayed considerable improvement over those of 1915. For 7910 miles of line the gross earnings amounted to $207,520,000, an increase of 6.34 per cent, while the net totaled $78,333,000, a gain of 5.78 per cent. This week we are publishing in our Financial Department additional figures from *The Commercial & Financial Chronicle.* For 294 companies the 1916 gross earnings amounted to $582,697,750, an increase of 9.65 per cent, and the net earnings at $219,236,230 represented a gain of 9.18 per cent. Both compilations include street, suburban and interurban railways. No comparison by miles of line or number of companies is available, but the greater scope of the financial journal's figures is apparent from its report of gross earnings more than two and a half times as large as the association's total.

That more satisfactory progress is indicated by the larger gross returns is encouraging, but it must be remembered that the gain made in 1916, a year of marked industrial prosperity, was large only as compared with those in the preceding two years. If we group the last three years together we find that the average annual percentage gain in gross was only 3.43 per cent, as compared with an average of 7.12 per cent for the preceding nine years, or from 1905 to 1913 inclusive. With increasing costs and taxes, with vast governmental competition for capital, the electric lines must be assured a better return in the future if they are to be able to attract new capital. The whole nickel-fare proposition needs a fundamental readjustment to modern conditions. Conditions are not improving, and the more quickly this change is made, the better.

A Resolution of the American Electric Railway Association

Passed April 30, 1917

"WHEREAS, the President in a proclamation to the people of the United States, has urged the conservation of all resources and the devotion of all energies to the sole purposes of bringing victory to the arms of the Nation in the war upon which it has so justly entered, and

"WHEREAS, to the managers and operatives of the transportation systems of the country, the President addressed the following particular admonition:

> *To the men who run the railways of the country, whether they are managers or operative employees, let me say that the railways are the arteries of the Nation's life and upon them rests the immense responsibility of seeing to it that those arteries suffer no obstruction of any kind, no inefficiency, or slackened power; and*

"WHEREAS, this Association at its Midyear Conference pledged to the President, as the representative of the country, 'its patriotic support of all measures which you may take in upholding the dignity and honor of our country and the rights, property and persons, of its citizens on land and sea,' and

"WHEREAS, the efforts and energies of all electric railway officers, should in these times of stress be devoted to preparation of their systems for the added demands, both military and industrial, which may be made upon them and

"WHEREAS, the resources of the Manufacturer Members of the Association are at any time liable to call from the Government in the furtherance of its military plans, and the preparation of the customary convention exhibit entails an expenditure of time and money, which may well be devoted to objects more directly concerned with the public need, be it

"RESOLVED, by the Executive Committee of the American Electric Railway Association that the Convention and Exhibit of the Association, in its usual form, be abandoned for the year 1917 and that the Committee communicate to the Member Companies at a later date, the call for such meeting as may at the time seem proper to substitute, and be it further

"RESOLVED, that the Executive Committee in behalf of the Association, pledges anew its patriotic support to the Nation, and accepts in behalf of its Member Companies the trust imposed upon the Transportation agencies of the country, by the President, in so far as it applies to electric railways."

Approve Plan of No Convention

After the committee appointed to consider the plan of a convention this year had made the report published in the adjoining column, requests were sent to seven prominent members of the association for their individual views. These replies appear below:

CO-OPERATION WITH GOVERNMENT ALL-IMPORTANT

The present national crisis presents so many unusual problems, both local and national, that the association can more than ever justify its existence by aiding all its members in doing big things, and, also through active co-operation with the National Council of Defense, it can be of great value to our Government. To accomplish the best results it is necessary that each and all of us limit our activities to the consideration of the problems arising out of the present crisis.

L. S. STORRS.

New Haven, Conn., April 30.

* * *

BEST EXHIBIT THIS YEAR INCREASED EFFICIENCY

The abandonment of the convention and exhibit of the association in its usual form is in line with our pledge of support to the nation and will have the indorsement of all our membership. We can, as an association, put on our greatest exhibit this year by working together for increased efficiency in our business.

JOHN J. STANLEY.

Cleveland, Ohio, May 1.

* * *

HIGHLY PROPER UNDER EXISTING CIRCUMSTANCES

The abandonment of the annual convention of the American Electric Railway Association is highly proper under existing conditions. We can all serve our country, the public and our companies better by devoting our energies along other than convention lines. The recommendation should be approved.

J. H. PARDEE.

New York, April 30.

* * *

LARGE CONVENTION INCONSISTENT WITH PRESENT PURPOSES

Conservation of food, fuel and labor are of pressing importance. Greater production was never more urgently needed. The members of the American Electric Railway Association should direct every effort toward giving our nation all possible assistance, and conserving the time of their officials and employees for the urgent requirements of our participation in the World War. The usual large convention would be inconsistent with our present purposes.

J. D. MORTIMER.

New York, May 1.

* * *

ACTION TAKEN WAS MOST WISE

The executive committee of the American Electric Railway Association has acted most wisely in determining to forego a convention this fall. The state of war with which this country is now confronted requires that public utility men "do their bit" in preparing this country for the strife that will test its men and resources to the limit. In addition to the regular duties, there is a real work for the public utility men along this line.

C. LOOMIS ALLEN,

Syracuse, N. Y., May 1.

* * *

MANUFACTURERS SHOULD CO-OPERATE WITH RAILWAYS

I heartily approve the proposed plan to abandon this year holding of the A. E. R. A. convention. The national situation is such as to make it imperative for everyone to remain at his post of duty, and make preparations to handle adequately the transportation of men and supplies that will devolve upon the electric railway companies. The network of electric railway lines in this country will prove a valuable asset to the government and a strong arm of the military service. Therefore, it is essential that railway officials bend every effort toward perfecting their organizations to meet the emergency. The manufacturers can also lend valuable assistance to the industry by making plans to insure maximum production in order to furnish the railways with material when it is required to keep the equipment in operation, thereby doing their bit toward achieving the victory that must be ours. I earnestly urge the manufacturers to co-operate with the electric railways to the end that our industry may develop its maximum efficiency as a military aid.

THOMAS FINIGAN.

San Francisco, May 2.

* * *

PLAN SHOULD RECEIVE SUPPORT OF MANUFACTURING MEMBERS

It is eminently proper to omit the convention this year, and I want to register my strong indorsement of the action taken by the executive committee. Everyone must realize the urgent necessity of giving all support to any agency that can be of such inestimable value to our government at this time as the electric railways will be. For this reason I am convinced that the abandonment of the convention will not adversely affect the membership of the association to any appreciable extent among the manufacturing members.

New York, May 1.

B. A. HEGEMAN, JR.

"FIND A WAY OR MAKE ONE"

Reference has already been made in these columns to a talk which was delivered recently before the employees of the Public Service Railway by Martin Schreiber on the subject of essentials for personal progress. Several hundred men listened to this talk with great interest, and even a casual observer could note that the words of the speaker aroused a responsive chord in the minds of his auditors. After all there is no more absorbing and profitable line of thought for anyone, in however unimportant a position, than that which directs him to greater opportunity and greater recognition. Starting from correct premises this line of thought will always lead to the conclusion that promotion is reasonably sure to the man who, while doing well the task on which he is at the moment engaged, is fitting himself for one a little higher up, and that nothing demonstrates better a man's fitness for promotion than his ability to get results under unusual and unexpected conditions. In the address referred to, the speaker cited, as examples of his main contention, cases of a dozen prominent officials of the local property whose careers showed consistent progress upward from comparatively unresponsible service. Undoubtedly every electric railway could furnish an impressive number of similar examples.

In studying the biographies of such men it cannot but be clear that their success has been due not so much to favoring fortune as to intelligent persistence in the face of difficulty. "Find a Way or Make One" is a fit slogan for the office boy who hopes some day to be president of the company, as well as for him who has already reached that high office.

WHAT MAY THE RAILWAYS EXPECT?

Now that an army of suitable strength has been assured to the country through the passage of the conscription law, it is pertinent to consider what effect the consequent withdrawal of a couple of million men from productive employment is going to have upon the electric railway industry. At least an approximate answer is to be found in the experiences of the Canadian railways, which have been going through this kind of economic readjustment for nearly three years and have most of their operating features in common with the electric railways of the United States. An outline of the conditions in Canada appears upon another page of this issue, and from this it is evident that no fear of a great disturbance need be felt by the railways on this side of the border.

Canada has raised an army that includes very nearly 6 per cent of the total population, and this figure is three times that generally mentioned as required from this country, so that on the face of it the disturbance here should be only one-third as great as it has been in the Dominion. As a matter of fact, many of the effects of the war have already been discounted here. Principal among them are the major part of the increases in wages, in living costs and in costs of materials which have been registered in Canada since the war began in 1914. As for the withdrawals of employees that are taken into the army, the Canadian railways' average loss was about 20 per cent and in this country the proportionately smaller army should reduce this figure to the order of only 7 per cent. What our electric railways face, therefore, is not a great disturbance, but rather a period wherein every source of economy must be exploited.

NO BIG CONVENTION FOR 1917

The action of the executive committee of the American Electric Railway Association in deciding not to hold a convention of the usual type cannot but commend itself to every interested patriot. Much as the omitted features of the convention will be missed it is far better to omit them than to raise any question of fitness or propriety. The best energies of the industry are needed on the job at home, especially during these days of uncertainty and anticipation. In addition the transportation facilities of the country will be taxed even further than ever next fall, if that is possible, in handling food, fuels, war supplies and other raw and manufactured products for our allies and ourselves. While in the aggregate the cost of a convention is a very small proportion of the country's annual expenses yet it is something, and the very fact that the railway men are willing to forego their convention will serve as an evidence of loyalty to their government.

Furthermore a convention, however desirable, is not essential to the prosperity of the railway industry. While it affords a splendid opportunity for the study of exhibits showing the latest products of the manufacturers, and for conference on operating and other problems, there are other although less efficient ways of accomplishing these things.

It is true that in the past the chief functions of the manufacturers at the convention have been to prepare the great annual exhibit and to assist in the entertainment of the delegates, and therefore the omission of these features will leave them with little to do this year. It is further true that since their admission to the association as company members in 1915 their status has not been defined so far as actual work is concerned. It must be remembered, however, that the problem of defining this status is a difficult one, and that a representative committee is diligently at work on its solution. We believe, therefore, that the manufacturers will stand loyally with the other members of the association in spite of the fact that their convention activities will be comparatively nil this year. The industry—operators and manufacturers—is behind the President to a company and to a man. Through the association they can most powerfully make their influence effective.

There is no lack of evidence that the electric railway men as a class are pre-eminently patriotic. The notes which are being printed in these columns from week to week reflect this patriotism. The decision to abandon the convention still further reflects it. Never was there such an opportunity to convince the country of our solidarity, and of our desire to "do our bit" in the service of that country, than is presented to us now.

Best Medical Attention Pays

How the Pittsburgh Railways and Affiliated Companies Have Built Up Cordial Relations with Local Physicians—How the Companies Care for Injured Employees and Promote Their Welfare

By W. M. HOLTZ, M. D.
Chief of Medical Bureau Pittsburgh (Pa.) Railways

THE medical and welfare bureaus of the Pittsburgh Railways, Duquesne Light Company, Beaver Valley Traction Company and Beaver County Light Company are part of the organization of the Associated Bureaus of these companies, all under the direction of Cecil G. Rice, assistant to the president. Their present activities are the outgrowth of eight years of careful planning by Mr. Rice. The chief of each bureau is responsible for the successful termination of specialized duties, backed by clear-cut policies and generous encouragement in any direction tending to promote greater efficiency. They receive from and give to the several other bureaus the utmost of functionally co-operative assistance.

RESULTS SPEAK FOR THEMSELVES

"The medical affairs of the Pittsburgh Railways and its affiliated companies are administered in a dignified, fair and honest manner which is recognized and credited by those who in past years were inclined to criticise. The full measure of what this means may be judged by considering that in every accident involving the traveling public and an electric transportation company there are from one to four or five physicians directly or indirectly concerned. Their influence to secure justice is well worth cultivating, and it is believed that in the district served by these companies a wonderful asset has been established in this way."—Dr. Holtz.

MEDICAL STAFF ORGANIZATION

All matters involving the medical profession and hospitals are handled through the medical bureau. The all-time staff of this bureau consists of a chief and two medical associates, a secretary-nurse and one clerk. There are, in addition, a corps of fifteen assistant physicians and surgeons, known as "welfare doctors"—not company doctors in any sense of the word—who are chosen on a basis of ability, experience and proximity to terminals and shops.

These welfare doctors are located at convenient points throughout the system of the various companies in three large and populous counties. To these medical men are assigned any unusual emergency, or the care of injured employees who may be unable to present themselves at the medical bureau's central office. These doctors receive no stipulated fee per month, but are paid for the professional services actually performed, at a rate sufficient to make the company's work attractive to them.

BUILDING UP CORDIAL RELATIONS WITH PHYSICIANS

One of the most important functions of the medical bureau is the upbuilding and preservation of cordial relations between the companies and about 3000 physicians and a dozen hospitals, with whom the business arising out of accidental occurrences on or about the companies' properties bring the medical bureau in contact. Strict adherence to the unique *Code of Ethics and Policies** of the Associated Bureaus has brought the maximum of good along these lines.

The medical affairs of the companies are administered in a dignified, fair and honest manner, which is recognized and credited by those who in past years were inclined to criticise. The full measure of what this means may be judged by considering that in every accident involving the traveling public and an electric transportation company there are from one to four or five physicians directly or indirectly concerned. Their influence to secure justice is well worth cultivating, in the opinion of the management, and it is believed that in the district served by the Pittsburgh Railways and its affiliated companies a wonderful asset has been established in this way.

THE COMPANY'S MEDICAL CODE

The *Code of Ethics and Policies*, under which all the bureaus operate, has long since received the stamp of approval by representative men in nearly every field of endeavor. The part covering relations with the medical profession is abstracted as follows:

"The high ethical standard adopted by the members of the medical profession, as well as the relations had by these Associated Bureaus with the large majority of those members, justify the assumption that the relations of the physician to his patient will remain solely professional in all cases resulting from injury in connection with the agents or properties of these companies. It is not expected that, under any circumstances, the physician will confuse his professional relations with the function of an adjuster of claims.

"These Associated Bureaus desire of the physician only that he shall report fully the extent of an injury; that he shall secure to the patient the promptest and most effective recovery possible; and that if he feels justified from his knowledge of the policies and principles which guide these Associated Bureaus, he shall make a suggestion to the patient that these Associated Bureaus do deal fairly and openly, and that the patient's interests will be best served by dealing direct, as in any other business matter, rather than by incurring the unnecessary expense of unavailing aid of others.

"It is held further that the principles and practices of these Associated Bureaus in relation to claims for injury are consistent with the highest business and professional ethics; and that such admonition from the physician to his patient as is bespoken herein cannot be derogatory to the interests of the patient or to those of his physician; but, on the contrary, if sincerely adhered to, must redound to the interest of all concerned.

"It would appear that a physician administering for the results of accidental injury, and particularly when received under the circumstances contemplated herein, may exercise frequently an influence upon the mind of the patient which will tend toward undelayed restoration to normal mental and physical health. Due regard for the high principles of honor and fairness, as well as for the ultimate physical welfare of the patient, is held to assure that there will be accorded the most beneficent mental, surgical or therapeutic treatment available."

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*Described in the ELECTRIC RAILWAY JOURNAL of Oct. 7, 1916, page 712.—EDS.

PHYSICIANS APPRECIATE COMPANY POLICY

The same policy of "absolute fairness, maximum accuracy and persistent courtesy" that pervades all the other bureaus of this organization are applied to the medical problems of the companies. For example, about seven years ago the so-called "company doctors" were abolished, free transportation for many such physicians was done away with, and as far as possible no favoritism was shown in the question of patronage. This immediately raised the companies' standing in the estimation of those medical men who theretofore had considered themselves discriminated against. Within a very short time the railway company was receiving prompt and usually satisfactory reports as to the nature and extent of injury of passengers meeting with accidents. The spirit of co-operation shown by the doctors generally in securing examination appointments for the companies' special examiners was most pleasing and has long since proved the wisdom of the changed policy.

PART OF SURGICAL SECTION OF PITTSBURGH RAILWAYS MEDICAL BUREAU

Reasonable fees are paid to physicians for emergency or first-attention services following an accident, provided a detailed report on forms furnished by the company for that purpose is mailed promptly. If during subsequent weeks the attending physician exhibits his fairness by giving information as to the progress of the injuries, and his bill for subsequent treatment is at all reasonable, his interests at the time of settlement direct with the injured person are protected to the extent of withholding that amount from the settlement. The company concerned then sends the doctor a voucher for the amount of his bill, which often he could not collect otherwise. This courtesy is much appreciated by the medical profession at large within the scope of the companies' patronage.

The medical bureau does not undertake the treatment of injured passengers except in emergency, but keeps in close touch with the attending physician in each case, arranging special examinations as may be warranted by the circumstances. In litigated cases medical defenses are prepared in collaboration with the trial attorneys, but seldom does any of the medical bureau staff appear in court.

These companies employ about 10,000 men. The hazards of their occupation are no less than in similar industrial fields, and in some branches, particularly the lighting and power business, the hazards are greater. The companies have long maintained toward their employees a policy of providing the best surgical, medical or hospital attention for the men hurt while on duty. Consequently the operation of the Pennsylvania workmen's compensation law, dating from Jan. 1, 1916, did not materially alter these medical matters.

In fact, the act itself had been anticipated, so that many months in advance of the Compensation Board's ruling on "reasonable" medical attention, particularly "first-aid" service, and "reasonable" surgical equipment by the employer, these companies were unusually well prepared to take over what added burden the compensation law may have brought about. The equipment of the medical bureau's central surgical section, which is located in commodious, well-lighted and well-ventilated quarters, is second to none in the country serving property of equal size and such varied demands. Part of the surgical section is shown in the accompanying illustration. This section, with the suite of offices connecting the medical bureau, has been most favorably commented upon by officials of other companies, labor union officials and visiting physicians.

ALWAYS LOOKING FOR THE BEST

As illustrative of the companies' generous attitude toward injured employees and the desire to provide the best approved surgical attention, there may be cited the importation and use of "Ambrine"—a paraffine treatment for burns. This substance, which has been popularized by French surgeons in the European war, was secured as soon as its merits had been attested. Its use has left nothing to be desired in the matter of relieving pain from burns and shortening the period of disability.

Of even greater importance to injured workmen is the adoption of the Carrel-Dakin antiseptic solution for the control of severe infections. In this connection the medical bureau expects soon to adapt a modification of this treatment to ambulatory cases. All of the companies' severe injuries are subjected to this method of treatment in a hospital.

CARING FOR TRIVIAL INJURIES

The subject of infections and resulting disabilities, deformities and even death from apparently trivial injuries, while not new, is receiving the closest study, and an earnest effort is being made to minimize this preventable loss of time and needless suffering. Compulsory medical inspection has not been attempted. Rather a personal appeal to the employees, coupled with emphasis on the tragic illustrations of their fellow employees' unfortunate occurrences, and simple first-aid instructions are being tried.

The men are urged to report any accident to themselves or others, no matter how insignificant the injury may seem to them—particularly any break of the skin or an eye injury. The necessity of immediate application of tincture of iodine to the broken skin is impressed upon the men. Where this simple first aid can be relied upon and the injury is not disabling, a suitable protective dressing is used. The injured man's foreman is then held responsible for having the man consult a doctor as quickly as possible within twenty-four hours.

INSTRUCTIVE BOOKLETS FOR EMPLOYEES

About a year ago booklets, setting forth the salient points of the compensation law, were distributed to every employee. These booklets also carried safety suggestions and invitations to the employees to consult the chiefs of the medical or welfare bureaus upon any medical matters or questions arising out of their accidents. There was also in each booklet a folder on which were designated the welfare doctors, their addresses and telephone numbers, and the location and telephone numbers of the hospitals nearest to any particular terminal, power station or large shop.

On these folders are the following instructions for action in case of injury to employees:

> *First*—Send injured employee to medical bureau, surgical section, Room 510, fifth floor, No. 435 Sixth Avenue, if the injury, his appearance and condition would not make the trip objectionable or
>
> *Second*—Send injured employee to nearest hospital.
>
> *Third*—Send injured employee to or call nearest welfare doctor.
>
> *Fourth*—Telephone medical bureau and report only nature and extent of injury sustained and action taken, or for advice if undecided what to do.
>
> *Fifth*—Make out and forward "Report of Injury to Employee" to welfare bureau, Room 522, fifth floor, 435 Sixth Avenue.

It has been found that observance of the fourth instruction serves to check up the accident reports which otherwise would be delayed or not made. The foremen are told that their responsibility ceases when they report an accident, no matter how trivial. From the receipt of the report the responsibility for following up and making sure that the injured employee receives proper attention is assumed by the welfare bureau.

More detailed explanation of the foregoing instructions are prominently set forth in the booklets, as follows:

> If the injured employee is unable by reason of the nature and extent of the injury, appearance or condition, to go to the medical bureau, he should be taken or sent to the nearest hospital or the ambulance of the hospital called. Serious injuries such as broken bones, fractured skull, deep and extensive burns, or severe and extensive lacerations, can best be treated at a hospital. Hospital accommodations are arranged for dressing wounds as well as where the injury is of such nature as to require nursing and confinement.
>
> If for any sufficient reason instructions No. 1 and No. 2 cannot be carried out, the injured employee should be sent to the nearest welfare doctor, first telephoning to make certain the doctor will be in his office. If the injured employee is not in condition to go to the welfare doctor's office, have the doctor come to the injured man.
>
> If the nature of the accident is such as to make instructions No. 1, No. 2 and No. 3 impracticable, or if the emergency is such as to make necessary the calling of a doctor nearer the location of the accident, such action may be taken. In such instance, however, the doctor so called must be specifically informed that his services are requested for the emergency or first attention only and that he will not be expected to render further service unless so instructed by the medical bureau.
>
> These arrangements are considered liberal and will be so interpreted by those in direction of the work. They are not intended to prevent any action in extraordinary cases which would be for the employee's best interests and comfort.

THE WORK OF THE WELFARE BUREAU

In treating injured employees, teaching them the fundamental facts of first aid to the injured and advising them from time to time in health matters, the work of the medical bureau touches in close co-operation with the welfare bureau. The duties of J. L. Roche, chief of the welfare bureau, bring him into the same personal contact with employees that characterizes the surgical attention following accidents, and both forces have unusual opportunities to assist in the constant campaign in behalf of safety and the prevention of accidents.

Mr. Roche personally makes the compensation payments to the men, visiting them at their homes or in the hospitals, or receiving them at his office. Frequently these payments are for more than actual compensation under the law, including, in addition, such welfare payments for entire loss of time, extra expenses and other items as may be properly recommended by the employee's superintendent or general manager. In fatalities the welfare bureau often makes immediate payment of money for the emergency, the formal approval for which is always forthcoming later. The official receipt that is executed for a disbursement shows definitely—as pointed out to the employee—just what amount is paid under legal requirement, how much extra is paid as welfare allowance and at whose request the latter payment is made. This serves to remind the employee that his employing supervisor considers length of service, general merit and loyal conduct, or the reverse if for enforcing discipline no recommendation is made.

BRINGING THE WELFARE BUREAU AND THE INJURED EMPLOYEE TOGETHER

By requiring the injured employee to present himself whenever possible at the offices of the medical bureau, there is a decided saving of time and expense and the maximum of benefit to the employee. The requirements of the Compensation Board as to detailed information regarding accidents and machinery involved therein makes an interview with the chief of the welfare bureau or one of his assistants quite necessary. In no other way can the desired facts be secured satisfactorily. It is manifestly much cheaper to have the injured employee, with his hurts properly attended, step into an adjacent office and furnish the required information about his accident than to later send a representative of the welfare bureau to him for that information. The injured man is thus placed in touch with the bureau, with which he may have prolonged dealings.

In addition to these considerations the employee receives the benefit of the best surgical equipment and attention which specially suits the needs of his case with better results than might otherwise be obtained. It is believed that a greater degree of success in handling accidents to employees and a more reasonable attitude toward the employer can be secured by thus injecting the personal tone into what frequently are economic catastrophies to the breadwinner. So successfully have the foregoing policies worked out that for more than a year's operation of the compensation law not one petition was filed with the compensation referee in the local district, and as far as is known no complaint was made about the medical attention furnished.

Statistics of these companies in accident cases involving their employees show conclusively that the cost of accidents may be materially decreased by systematic central safety organizations, working jointly and coordinately with first-class medical supervision. No longer is there any doubt in this matter, as viewed by the most successful executives of big industries. Hand in hand with this idea is that of the employer having accurate appraisement of the physical condition of his employees, not only at the time of application for employment, but at stated intervals, to the end that the human investment may be conserved for mutual good. Misfits and rejections there always will be, but as the spirit of humanity becomes more established the modern conception of fitting the job to the man will supersede old methods. Experience has shown that the wasteful turnover of labor can be cut down to a small percentage.

Southwestern Association Meets at Dallas

At Its Sessions the Railway Section Discussed Papers on the Subjects of Power Stations, Track, Car, Car Shops, Automobile Competition and Other Present-Day Problems

THE annual convention of the Southwestern Electric & Gas Association, held at Dallas April 26 to 28, was attended by about 300 people. Several entertainments and a Jovian rejuvenation interspersed the business sessions, while the regular papers attracted lively interest and were followed by frequent discussion.

At the opening meeting F. R. Slater, president of the association and general manager Texas Power & Light Company, spoke of the need of efficiency and intelligent thought in utility management, now more important than ever before because of the war crisis and the probability that a portion of the employees would be called away for military service. The education of the public as to its rights and those of the public utility he considered to be of the greatest importance to the association members for, as has been said, all business is based on confidence.

FIRST RAILWAY SESSION

In the afternoon the electric railway section voiced an optimism as to the future and a confidence of the ability of the railway companies to solve the present-day problems. G. H. Clifford, Northern Texas Traction Company, Fort Worth, was chairman of this section. Four papers were read and discussed by a large part of the members attending.

"Betterment of Central Station Management," by C. R. Roberts, betterment engineer Stone & Webster Engineering Corporation, Fort Worth, was the first paper in this session. In response to some questions the speaker said that as a part of this betterment his company had installed a CO_2 recorder on each boiler and that form blanks, showing when boiler cleaning was necessary, were made out and signed by the cleaner and the chief engineer at each scheduled cleaning. An abstract of the paper by Mr. Roberts is published elsewhere in this issue.

"The Maintenance of Way Department To-day" was the title of the next paper. It was read by B. R. Brown, superintendent maintenance of way, Dallas Electric Company, and brought on a discussion of joint welding and track grinding. An abstract was published last week. W. B. Tuttle, vice-president San Antonio Traction Company, said that in its track work the company had found the Goldschmidt thermit insert weld very satisfactory, and the joints are hard to find afterward. There is no trouble with cupping, and most of the later rail breaks come in other portions of the rail. The reciprocating track grinder handles corrugations very effectively, but owing to the cost of this method the San Antonio company is at present trying out a rotating grinder.

The use of the electric welder was recommended by several others on smaller roads, in spite of its first cost, because of the saving it would effect in the end, due to reclamation work and the postponement of reconstruction.

Theodore Taylor, master mechanic Northern Texas Traction Company, then gave "A Few Thoughts on Car Shop Practice." Adding to this, Mr. Brown remarked that all inspection on the Dallas railways was made on a mileage basis, the period being every 500 miles, or about every third day. This eliminated the usual troubles about as soon as they started. The last paper was "The Influence of the Automobile on the Interurban," by James P. Griffin, general passenger agent Texas Electric Railway. Abstracts of both appear on later pages in this issue.

At the close of the afternoon session it was announced that the "King of the Rails" films, showing construction details of the G. E. electric locomotives of the St. Paul Railway were run twice a day during the convention at one of the Dallas theaters. A buffet dance, complimentary to the visiting ladies, the members, and guests, was given by the Suppliers Section of the association in the Palm Garden of the Adolphus Hotel that evening.

SECOND RAILWAY SESSION

The session on Friday morning was opened by a paper by V. W. Berry, general superintendent Northern Texas Traction Company, on "Vital Present-Day Problems of the Street Railway Operator." This paper was printed in abstract last week. In the discussion it was the general opinion that while the use of automobiles in the country often brought passengers to the line, in the city each new machine on the streets was a loss to the company, largely because of the practice of automobile owners to pick up friends and carry them to and from town. Mr. Clifford and Mr. Tuttle estimated the loss in revenue to their companies from a new automobile on the street to be $40 per year and 15 cents per day respectively.

To meet the present-day demand for speed and better service, light cars capable of quick acceleration and deceleration, and traveling on a schedule of more frequent headway were urged. W. A. Sullivan, manager Shreveport (La.) Railway, cited as an example of the effectiveness of this the experience on a certain 7½-mile branch of his company. On this branch in 1915 the company operated nine cars and carried a large volume of traffic. When the jitneys came along it was hard hit. Eventually the company put on thirteen cars and speeded up the schedule and now has a larger business on this line than in 1915.

The telephone dispatching system of the San Antonio Traction Company and the flexibility which it gives the system were explained by G. W. Merritt, chief dispatcher for the company. The motormen report by telephone at the end of each run and the traffic inspectors from downtown line intersections. The whole system is owned and maintained entirely for their use by the Southwestern Telephone Company, at a cost of $135 per month.

BUSINESS SESSION

On Saturday afternoon, after the light and power session, the nominating committee made its report and the association unanimously elected the following officers for the ensuing year:

President, H. C. Morris, general manager Dallas Gas Company; first vice-president, D. A. Hegarty, president Texas Gas & Electric Company, Houston, Tex.; second vice-president, W. A. Sullivan, manager Shreveport (La.) Railway; chairman executive committee, F. R.

Slater, general manager Texas Power & Light Company, Dallas.

Galveston expressed its desire to see the convention return to it next year but the location of the coming meeting was not determined.

The Influence of the Automobile on the Interurban*

The Author Analyzes the Effect of Automobiles Both in Increasing and in Decreasing Traffic

BY JAMES P. GRIFFIN
General Passenger Agent, Texas Electric Railway, Dallas, Tex.

THE automobile is both increasing and decreasing interurban receipts. It is both building up and tearing down, adding to and taking away.

In support of the statement that the automobile is increasing interurban receipts, I offer two propositions. First, the privately owned automobile is bringing people from off-line points to the cities and towns on the interurban for the purpose of using the interurban in completing a trip to some other point, generally at quite a distance. In order to secure any great benefit from such condition it seems to be necessary that the interurban line be of some length. Second, the automobiles operated for hire between country villages and settlements and the larger centers of population on the interurban lines, what we might term "interurban jitneys," are bringing to the interurban many patrons. In our section of the country there are a number of these "interurban jitney" routes, the cars operating on schedules timed to make connection with our cars.

The fact that the automobile is decreasing interurban receipts is easily established. Man is a social being, and seeks the company of his kind. When starting on an automobile trip, it seems that his first thought is for some one to accompany him. Our agents tell me that time and time again automobiles passing their stations stop and call from their waiting rooms people who are there awaiting the coming of an interurban car. This happens not merely in one place, but in many. It is the most common of all reports given by agents. It is more noticeable in the smaller towns, where everyone seems to know everyone else.

This is eating into the short-haul travel of the interurban. The long-haul is not being so much affected, yet on the occasion of the recent visit of ex-President Taft to Dallas I found here people living in Hillsboro, 66 miles distant, who had made the trip by automobile.

We sell round-trip tickets, and receive a number of requests for refund on the unused portions thereof. The most common of all reasons given for not using the ticket is "made the trip in an automobile." During the month of March, 1917, we handled a total of 437 refund claims, 156 being made by people who either made the going or returning trip, or both, by automobile, this being 35 per cent of the total number of all claims. This shows a direct loss of revenue.

Many traveling men representing local wholesale grocery and drug houses, etc., have purchased automobiles, which they are using in making their territory. Formerly these men made a number of their trips via the interurban. Now not only is practically all of their patronage lost to the interurban, but they also carry from town to town people who otherwise might have made the trip via the interurban.

Not only are passenger receipts reduced, but also express receipts. Automobile trucks, specially designed for freighting, are operating out of some of the larger cities, and in direct competition with interurban express. These trucks being heavy, of necessity, require good roads.

In striking the balance, giving credit for the increase, and charging for the decrease, it is readily apparent that the automobile is causing a distinct loss of revenue to the interurban lines.

How long will this condition exist? How much longer will people continue to spend money for gasoline, oil, tires, repairs, etc., to make an automobile trip, which all in all costs more than if the trip were made by interurban? Grant you, of course, that the man in the automobile can start when he wants to, and return when his inclination directs, and has his car available for any running around he may care to do. Still the interurban schedules are fast and convenient. Gasoline is now 22 cents, and going up. Materials are increasing in cost, automobile concerns are raising the prices of their cars, tires cost more, etc. How long will it be before the car owner will sit down and seriously figure the cost to him of the trip in his automobile? When you get him to doing this, then you are beginning to win your battle.

How can this decrease in receipts be offset? As I see it, the interurban man should exert himself more and more to make his service more comfortable and attractive. Exert more efforts to please every patron. Dig into the surrounding territory more and more for increased business. Work to get competing lines to bring passengers to you. Work in the outlying districts to get the people to come to certain points in their cars and continue the trip via interurban from there. These are some of the many ways to increase business, and efforts spent thereon should bear much fruit.

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*Abstract of a paper presented at the thirteenth annual convention of the Southwestern Electrical and Gas Association, at Dallas, Tex., April 26-28, 1917.

Betterment of Power Plant Management*

Coal Analysis to Determine Chemical Content and Inter-Departmental Co-operation Will Effect Considerable Reduction in Operating Cost

BY C. R. ROBERTS
Betterment Engineer Stone & Webster Engineering Corporation, Fort Worth, Tex.

THE power plant requires a generous portion of the total investment in equipment of an electric power company, and its operation consumes a large part of the total running expenses. As the demand for more frequent service and competition in traffic handling has led to improved equipment and improved transportation methods, so has the increased cost of fuel and other materials led to improved equipment and improved operation of the generating station. When one realizes that three-fourths to four-fifths of the total operating expense of the station is expended for fuel, the seriousness of the fuel situation as it to-day confronts the street railway and electric lighting properties is apparent. This part of the operating expense will increase in direct proportion to the increased cost of fuel unless some decided improvement in operating economy is effected.

FUEL SUPPLY

The most common two fuels are coal and oil. The property which is located within economical reach of oil is extremely fortunate, as nature has produced in oil a fuel much less troublesome than coal. The fortunate ones may, however, be informed at any time by the oil companies that distillate can be successfully refined into a product more profitable than fuel. The price of coal in the Southwest and West will then depend upon the generosity of the mine operators and railroads in those sections.

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*Abstract of a paper presented at the thirteenth annual convention of the Southwestern Electrical and Gas Association at Dallas, Tex., April 26-28, 1917.

One of the most important steps to be taken in improving station economy is the proper selection of fuel. Although bituminous coals look as much alike as a team of Kansas mules, there is, without proper handling, a decided difference in pulling power in both cases. In selecting coal the supply and transportation facilities should be investigated to insure a continual supply sufficient for operating requirements and for the accumulation of a surplus for emergency. To insure even quality the coal should be sampled as it comes through the mine tipple in cars. Then the chemical analysis will include an average amount of faults in the vein. The analyses made by the U. S. Geological Survey are not suitable for use in this work as they show only the quality of the pure vein of coal. Consequently the calorific values shown by them are considerably higher than the coal as received at the station would have. The coal to be selected should be the one that shows the greatest calorific value, taking into account its price and the equipment necessary for consuming it. A contract should then be entered into, the essence of which should be a continual supply of fuel at the standard calorific value, the contract price to vary in accordance with the calorific value above or below the specified standard. A very accurate average sample can be obtained by means of any improved type of automatic sampling machine located in the path of the coal entering the station bunkers.

CO-OPERATION IS THE BASIS OF BETTERMENT WORK

To improve operation conditions, it is first necessary to gain the confidence and co-operation of the chief engineer and his operating force. This can only be done by convincing them that the work to be undertaken is not a criticism of their methods or a reflection upon their ability. The greatest and most lasting results that are obtained through betterment work are those prompted by a free and unbiased exchange of ideas. When every operating man learns that he can freely express himself, whether he be coal passer or chief engineer, then the co-operation of all is definitely established and economies are sure to follow. In order to produce lasting results complete betterment work cannot be satisfactorily accomplished in less than six months.

The most important factors in station management are operation, maintenance of equipment and organization. In order to improve the economy in operation, the following work is usually necessary: Training of firemen; training in the economical handling of boiler feed water; scheduling of boiler operation, of boiler cleaning and operation of engine-room equipment; training of engineers; introduction of a proper operating log, and establishing of a proper system of accounting.

IMPROVING OPERATING CONDITIONS IN THE BOILER ROOM

After the proper design of furnace has been determined, the fireman should be trained in the economical combustion of the particular fuel selected. The boiler room should be equipped with instruments which he should be trained to use intelligently as a guide. Some of the most essential are an automatic or manual CO_2 recorder, and thermometers for feed water, steam and stack temperatures. Indicating thermometers and draft gages should be installed where additional operating data are necessary. These instruments should all be observed and readings recorded at least every half hour, and the CO_2 and draft readings should be observed continuously. The individual watches should be kept separately and the results posted in the boiler room for comparison by those on each particular watch. This promotes friendly rivalry between the operators and appeals to the pride of each, which has a tendency to produce even a higher standard of operation.

The firemen should be trained in the economical use of boiler feed water, maintaining at all times a maximum temperature and utilizing a minimum amount of exhaust steam. The manner in which each man handles this feature of operation is clearly shown on the recording thermometer chart connected to the feed-water system. Tests should be run to determine the most efficient load to be carried on boilers.

A boiler-room operating schedule which will call for the proper number of boilers to be operated by any given load should be put into effect. There is always a general tendency to operate boilers in excess of the load requirements. Accumulation of soot on the external sides of tubes should be carefully observed and a schedule for external cleaning put into effect, otherwise 3 to 5 per cent of the fuel may be wasted. If scale is accumulating rapidly on the internal surfaces of tubes a chemical analysis of the feed water should be made and proper treatment prescribed for the water.

THE ENGINE ROOM NEEDS CARE ALSO

In the engine room tests should be run on the main units to determine the most economical load for each. A schedule of unit operation should be put into effect which, when followed, will produce a maximum over-all engine-room efficiency for any given load.

The engineers should be trained and educated in the economic value of following this schedule, and in the economical operation of engine-room auxiliaries, at all times maintaining a maximum vacuum on condensing equipment, while circulating a minimum amount of condensing water. The amount of steam auxiliary equipment to be operated should be just sufficient for heating boiler feed water without waste of steam to atmosphere.

Operating log sheets should be introduced, showing graphically the load carried with a superimposed graph showing the capacity in equipment operated. The readings of all indicating graphic and recording instruments should be included in the operating log and arranged in such manner that a complete analysis of each day's operation can be made.

OTHER IMPORTANT MATTERS

Accounting for material used and material on hand, particularly fuel, is a very important feature in station economy. A complete record of operation should also be kept. A brief synopsis of the most important features should be sent daily to the manager or superintendent, informing him of the economic results of each day's operation. A schedule of systematic maintenance and inspection should also be put into effect and the condition of each piece of apparatus should be fully recorded. The schedule should be so arranged that each piece of apparatus is inspected a certain number of times each year, the frequency of inspection depending upon the class of apparatus. Thus none of the equipment in the station is overlooked, and by the adoption of a schedule of this kind many serious accidents to equipment and men may be avoided, and continual service insured at a minimum expenditure for maintenance.

To maintain and operate a modern power station at high efficiency it is necessary to have an organization of more than average intelligence. It is therefore necessary to do considerable educational work within the organization. To encourage the individuals along educational lines some companies have advised employees to take correspondence school courses, and as soon as a course is complete they are reimbursed for the cost by the company. The plan has produced very satisfactory results. The rapid strides that are being made in power-station equipment and the necessity for its improved operation make it very necessary that the educational standard of the organization be advanced. If this is not done it is useless to expect a maximum result in operating economy.

As a result of following plans such as those outlined, operating costs can be easily reduced from 10 to 20 per cent, the condition of equipment can be improved without additional expense for maintenance and the operating force will be competent to cope successfully with new operating problems that may arise.

Thoughts on Car-Shop Practice*

The Author Outlines Methods and Costs Obtaining in an Efficiently Operated Electric Railway Repair Shop

BY THEODORE TAYLOR
Master Mechanic Northern Texas Traction Company,
Fort Worth, Tex.

IN 1910 the cost of maintenance of rolling stock of the company with which the writer is connected was slightly in excess of $17 per thousand car-miles. For the year 1916, the same expense accounts amounted to $8.25 per 1000 car-miles. This reduction was made possible by various causes acting together—it would be unjust for the shop to take the credit for all the saving. To the designers of the equipment and its builders, together with many others, belongs a good share of the economy effected.

Too much emphasis can hardly be placed upon the necessity of regular and systematic inspection of all parts of a car, and more especially is this true of the motive equipment. It is exceedingly good practice to place a car over a pit every four or five days at the least and then give the motor a thorough inspection. The openings in the motor case allow, with the use of a flashlight of generous proportions, pretty thorough examination of the surface of the commutator, the condition of the banding, loose coils, defective connections, inclination of and condition of brushes and other details. A fiber gage can be used to determine whether the bearings are letting the armature down in the slightest, and it is possible practically to eliminate the danger of tearing up an armature in that way. All trolley wheels should be inspected and set straight in the poles and the bases lubricated and adjusted for tension every sixty days. Adjusting the tension between close prescribed limits by means of a spring balance, changing the shape of the groove of the wheel after carefully investigating the subject of wheel wear and consulting with the manufacturers, and faithful inspection have brought our mileage on the interurban division from 1500 to 4500 miles per wheel, and made a corresponding saving on the city lines.

Lubrication costs are capable of amazing reductions. The writer now lubricates an entire system for 17 cents per thousand car-miles, whereas a few years ago 28 cents was the figure. Heavy blue felt of the highest degree of absorbency, immersed ten days or more and thus thoroughly saturated with lubricant, then cut to size and placed in the motor oil cup has proved for years a most dependable method of lubrication.

One of the principal savings made by the writer in some years has been through the purchases of an electric arc welder. Motor cases, gear cases, armature shafts, worn journals, broken brake rigging, the smaller truck parts, practically, in fact, all the lighter forgings and castings about a car can be repaired quickly and economically. For example, in the case of a loose pinion and enlarged keyway, without the welder, it would be necessary probably to renew not alone the shaft, but a full set of coils, mica rings and insulation.

It should be of interest to all operators to learn of the success which can be made with the color-enamel system of painting cars. A car can be put through the paint shop and be out of service less than two weeks and require an expenditure of labor and material of from one-third to one-half of what was necessary under the old paint and varnish system. For the small, single truck car the old method cost approximately $120, while through the use of the imported color enamel, the cost is $45 per car, besides the saving in idle time. The figures for the double truck car are $130 against $55. The job stands up better than in the case of the old system, for the surface retains its luster and remains free from fine cracks. The variety of shades available is, to be sure, limited, but our system is at present using the material on all city car bodies and trimmings, thereby getting much longer life, a better appearing car and saving anywhere from $70 to $80 per car.

As a general proposition it can be asserted that it is poor economy to purchase anything but the best of material. The best grade of waste at 28 cents per pound for lubricating purposes is more economical than a waste that could be used and cost one-half as much. It would seem poor economy, judging from the writer's experience, to purchase anything but a babbitt metal with a tin content of at least 85 per cent. Trolley rope of the highest grade at 50 cents per pound is a better investment than the salesman's "just as good" at 35 cents. Car maintenance and repair material may be bought intelligently and with an eye toward saving, but our experience is that in material which has to stand up under the conditions confronting the ordinary street car, the best is none too good and purchases should be made fundamentally on a quality basis.

There is no department of the average street railway in which ancient practices can take firmer root than in the repair shop. Anything that will bring to the attention of the foreman and the men new methods and the results to be obtained from applied ingenuity will have most excellent results. All the men should, at the very least, have access to the current trade journals, and if it is in any way possible, they should be induced to take out subscriptions of their own, the company assuming a portion of the cost.

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*Abstract of a paper presented at the thirteenth annual convention of the Southwestern Electrical and Gas Association, at Dallas, Tex., April 26-28, 1917.

An Appeal to Auto Owners

The New York, New Haven & Hartford Railroad in its campaign to prevent accidents at grade crossings has issued posters urging drivers to use extreme caution in crossing railroad tracks. These posters are being displayed in conspicuous places along the New Haven lines. The posters call attention to the fact that more than 2000 persons were killed in 1916 in grade crossing accidents. Also that the number of persons killed and injured by these accidents is increasing at the rate of 25 per cent each year. In the first two months of this year there were ten accidents of this kind on the New Haven road, in which six persons were killed and thirteen injured. The posters are a direct appeal for a greater exercise of care by the automobilists of New England.

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Canadian Experiences In War Time

Even with Nearly 6 Per Cent of the Population Under Arms, the Electric Railway Industry of Canada Has Been but Slightly Affected by the War—The Labor Shortage Has Been Marked, but Traffic Frequently Has Been Stimulated

JUDGING from the experiences of Canadian electric railways during the last three years, the entry of the United States into the war will make hardly more than a negligible change in the conditions of electric railway operation in this country, even with the raising of an army of 2,000,000 men. This conclusion is based upon the fact that our ally to the north, with a population somewhat in excess of 8,000,000, has enlisted an army almost 500,000 strong, thus sending to the front nearly 6 per cent of the total number of inhabitants. In the United States, with 100,000,000 people, the proposed army of 2,000,000, which appears to be the generally accepted probable maximum, will result in the engagement of only 2 per cent of the population by the active military establishment. Such a small percentage—one-third of the Canadian figures—can hardly exert an appreciable effect upon our electric railway industry, since the Canadian railways have been influenced only to a minor degree by an economic disturbance three times greater, relatively, than that which is likely to obtain in the United States.

For the average Canadian electric railway the outstanding features of wartime conditions have been a marked increase in wages and cost of material over 1914 and a considerable change in personnel, mainly because of enlistments. Aside from these items the alteration in general conditions surrounding electric railway operation have been almost insignificant in character. In fact, the majority of reports state quite definitely that conditions have not been materially altered, the increased cost of operation being frequently offset in large part by an increase in traffic.

There have been heavy withdrawals of electric railway employees from service, due almost altogether to enlistment in the army. The loss from this cause, which varies from 10 per cent to 30 per cent has, apparently, been characteristic of every railway company, but the extent of the loss seems to be dependent upon no particular set of circumstances. Since only the volunteer system of recruiting has been in force in Canada, no class of labor has been exempted, and the electric railway industry has been drawn upon just the same as the other industries of the country. However, it is reported that the National Service Board, which recently has tabulated the man-power of the Dominion of Canada, does not propose making use of electric railway employees in any other than the positions they now hold, in case extensive redistributions of labor are attempted.

WITHDRAWALS OF EMPLOYEES

Platform men, because of the large number employed, constitute the major part of the withdrawals. All departments, however, are represented, and it is said that, since there are so many branches to the modern military organization, it is almost impossible to find a man in Canada to-day who cannot be used by the government in some capacity or other. Transportation is a very prominent feature of warfare, and good transportation men, as well as railroad engineers, both civil and mechanical, are in great demand. The demand applies even to ordinary railroad laborers. In some cases engineering and operating officials are considered to be of greater assistance to the cause if they remain in their civil positions owing to the fact that the roads employing them may be furnishing service that is vital to communities given over to the manufacture of munitions.

Only a comparatively small percentage of electric railway employees have left the service for the purpose of taking up munitions work, but withdrawals have generally been heavy among employees having mechanical training. In the Western provinces farm labor has drawn an appreciable number of electric railway employees out of service, and one Western railway, which reports the loss due to enlistment at 30 per cent, gives the loss to the farms as 35 per cent, and withdrawals for various positions carrying greater remuneration (owing to the scarcity of labor) as 20 per cent.

At present there seems to be a tendency toward eliminating young men altogether from the personnel of electric railways in Canada. One company reports that all young men either have enlisted or else have been let out of the service, and their places have been filled by men who are not eligible for military duty.

In general, the opinion seems to be that about the same or a slightly smaller proportion of men have left the electric railway industry, either for enlistment or for munitions work, than has been the case in other industries. In one locality the loss of the electric railways was between 15 per cent and 20 per cent, while from the coal-mining industry in the same district the loss was 24 per cent. In only a few cases is the loss from enlistment believed to be greater in the electric railway field than in other industries.

MAINTENANCE OF PERSONNEL

Filling the places of the employees that have left electric railway service for various reasons connected with the war has been the most prominent problem faced by the industry in Canada, yet on the whole the consensus of opinion seems to be that the maintenance of the personnel has not really been difficult. The quality of labor for replacement, however, has been inferior, and in certain instances this has resulted in the introduction of one-man cars and even in the employment of women.

For patriotic reasons a number of electric railways have made special rules in regard to the selection of men for replacing withdrawals. One company states that no single men eligible for military duty have been employed since the war began, and for some time past preference has been given to applicants in the following order: Returned soldiers, soldiers who have enlisted and have been rejected before proceeding to the front, men who have applied for enlistment and have been rejected, and, finally, to married men who have not enlisted. In this particular case, however, the local scarcity of men does not appear to be so severe as it is throughout the Dominion in general.

A wholly different situation is evidenced by the following quotation from the manager of another company: "Operating, as we do, in a large industrial center, our labor situation has been acute for some time. To date we have been able to find men for the vacancies caused by employees enlisting, but in the more recent months the quality of labor that we have obtained has been inferior to that which was on our payroll prior to the war. We are looking forward to the necessity of employing women conductors in the near future, provided we find it unwise to attempt operating one-man cars. We believe this latter type of car to be one of the solutions of our labor situation, and the present time is most opportune to inaugurate their use. We have found it increasingly necessary to introduce labor-saving machinery and methods, not only from the standpoint of obtaining the greatest output from our present employees in maintaining the service that we gave prior to the war, but also to enable us to undertake the additional work necessitated by our increased business."

The general opinion, or average situation, is perhaps best outlined by an official of a city railway of moderate size as follows: "We have experienced no difficulty in maintaining our forces, although most of the men that we originally employed were young and many of these have enlisted, so that we have had to fill their places with older men who are perhaps not so reliable nor so well trained. We replace these men as far as possible with returned soldiers who have been unable to continue at the front either from wounds or other causes. We have had no difficulty in keeping together our force of shopmen. This has been a question of wages only, and as long as we could keep our shop employees' pay up to that of the munitions factories the men have been content to remain. In fact, they have remained with us at a lower rate of pay than they could have obtained by working on munitions as they have realized that their employment here is steady. In addition, they are used to our work and prefer it to the more erratic and laborious employment in munitions plants."

From the foregoing paragraphs it is evident that the problem of maintaining the personnel varies greatly according to the locality, and although the majority of roads seem to find the problem of replacement of employees not an insurmountable one, there are others that find it exceedingly acute. In the latter case the need for labor-saving devices is more definite, and in the smaller cities the idea of one-man car operation has become popular. There is, of course, nothing to prevent the working out of this system to the satisfaction of everyone concerned and to the betterment of the rising cost of operation, which is very greatly increased.

WOMEN CONDUCTORS TRIED OUT

Owing to the experience with women conductors in England the use of women in Canada has received considerable thought, but apparently the plan has been actually tried out in only one instance. The following quotation gives an outline of the results in this case: "A result of the scarcity of available labor that was very strongly felt in this district came through employees taking advantage of the opportunity to agitate for higher wages. Because of the urgent call for volunteers and for farm help, we resorted to the expedient of employing women, and this has had several far-reaching effects. First, the unions, or the employees in general, recognized that the supply of women was a large one.

"With the women paid the same wages as the men the work was attractive to women, and the shortage of labor in this manner was made up. This stopped agitation on the part of the men. In the second place, the women took hold of their work in a surprising way, going through their training period more quickly than the average man. Thus far the women appear to be more exact and more conscientious in their work, and they are able to do everything the men did, with the exception of climbing upon the tops of the cars. To date we have used them only as conductors, and I would say that they have been a marked success. We have recently contemplated using women as oilers or in similar positions in the power house.

"After our experience here in a small way with wartime conditions, I feel that other and larger roads might seriously go into this question of replacing male employees with women wherever possible. A great number of difficulties would then disappear through the freeing of men for active military service, or for work upon munitions or on the farms, and in doing this a new source of labor supply is opened up with which to temper conditions and to prevent undue labor shortage, which always brings in its wake unrest, agitation and labor troubles. Our practice is to employ women of thirty years of age or over, war widows, or women whose husbands are at the front."

INCREASED WAGES

Naturally the shortage of labor that has existed in Canada through the withdrawal from productive employment of 500,000 soldiers, together with the still greater number of munitions workers who supply their needs, has brought about large wage increases since 1914, with the possibility of still higher rates in future. In one case, which is thoroughly typical of average conditions it is stated that platform men, carhouse men and practically all mechanics were receiving 27¾ cents per hour when the war broke out in August, 1914. This rate was increased to 30 cents per hour on Oct. 1, 1916, and was again increased to 33 1/3 cents per hour on Jan. 1, 1917, thus making an increase of 20 per cent since the outbreak of the war. The wages of those in other capacities on this property and those who are in charge of the operation have been increased from 7½ per cent to 10 per cent.

Accompanying the increased wages, the cost of living for employees has also risen rapidly so that, in many cases, workmen are probably no better off, if as well off, as they were before the war. This condition, as well as the shortage of men, has had a very definite effect upon labor unrest, and although labor troubles have not increased, it may be that they are rather held in abeyance than made definitely less. One report states that labor troubles have "increased, but not to the breaking point," as the government of the country during the war and the sentiment of the people in addition have a restraining influence upon the labor unions.

THE WAR AND CANADIAN ELECTRIC RAILWAYS

Canada, with a population of 8,000,000, has raised an army of 500,000 men—practically 6 per cent of her population.

Enlistments from Canadian electric railways averaged 20 per cent of the total number of employees. This is approximately the same percentage that applied to other industries.

Relatively few employees have left electric railway service to work in munitions factories, but withdrawals to the farms have been marked in the western provinces.

A labor shortage has been increasingly evident, but replacement of withdrawals has not been really difficult up to the present. One-man cars and women conductors have been introduced in some instances.

Wages have generally increased since 1914, paralleling the experience of the United States. The prices of materials have been greatly augmented.

Traffic has frequently increased, but the net results from operation of most electric railways have not been altered materially since 1914.

TRAFFIC, OPERATION AND MAINTENANCE

In general, the business condition of Canada has been one of great prosperity subsequent to the first months of the war, this being due to the immense amount of money spent by the government for supplies and for the labor engaged in the munitions factories. Particularly in the steel-making and manufacturing districts the general business prosperity has had a very favorable effect upon traffic, but the increased business of the electric railways has not generally kept pace with the increase in operating and maintenance costs. A majority of the companies consider that, in the final analysis, the net results from operation for electric railways have not been altered materially since 1914, even though traffic has very generally increased.

In some instances, of course, especially in the smaller cities, traffic has fallen off. This has been ascribed to the withdrawal of so many men from all classes of business, especially the mercantile trade, without the stimulus that munitions plants have brought to manufacturing districts. Consequently, in the small towns there are not so many people to ride, and in addition the high cost of living keeps many people from spending their money for car fare. On interurban roads the passenger traffic seems generally to have increased because of the establishment of recruiting stations in the larger towns and cities and the consequent stimulation of travel between these points and the country districts.

A very considerable amount of traveling appears to be done by soldiers off duty, and this has an appreciable effect upon the traffic returns. There is no standard practice in regard to free or reduced transportation for such travel. The majority of roads make no arrangement for reduced fares or free riding for individual soldiers, and the prevailing attitude on the question seems to be fairly well summed up by the following quotation: "All other lines of business are being paid exceptionally high prices for their output, and we do not believe that electric railways should be expected to carry free, or even to make reduced rates, for such transportation in view of the small margin, if any, that exists between income and operating costs."

Reduced fares for soldiers in uniform have resulted in one case in the sale of ten tickets for 25 cents in place of the regular ticket rate of six tickets for 25 cents, and in another case special tickets at 2½ cents each. One interesting result of the issuance of free transportation to soldiers in uniform appears in the 1916 figures for a city system, which show that no less than 6 per cent of the road's total traffic was given gratis to soldiers!

Another phase of electric railway operation that has been materially affected by the war appears in the great increase in the cost of materials for maintenance. The cost of maintaining railway property and equipment has increased in some cases by nearly 50 per cent, and the cost increase has been especially marked in the case of material that is brought in from the United States. Freight shipments of materials also are most uncertain because of the congestion of the railroads through the movement of troops and war munitions, and to overcome this many shipments which otherwise would come by freight have been routed by express in order that the material would be on hand when needed. Aside from this, deliveries on materials are, in general, much delayed and the standards of quality have, in many cases, been greatly reduced.

MISCELLANEOUS WAR-TIME ACTIVITIES

Practically all of the Canadian electric railways have made special efforts to stimulate enlistments not only among their own employees, but also on the part of the public in general, through the display of posters and other forms of advertising on the cars. This is, of course, a natural development from the adoption of the volunteer system. Payment of wages to employees who have gone to the front appears to be exceedingly unusual, but the younger men have been almost invariably encouraged to enlist. The following quotation covers a typical case of the attitude of a railway company toward its enlisted employees: "All of the men who enlist will be given their positions when they return in the same place on the seniority list as when they left. Our standard agreement calls for employees to indemnify the company for the cost of their uniforms if they leave within a certain time after employment by our company, but we have waived this for men who have enlisted. The street car advertising company has, at times, placed cards in our cars for recruiting purposes, and we have accommodated different battalions and batteries by placing recruiting banners on the sides of the cars and recruiting signs on the fenders."

An interesting comment in this connection appears in the statement of the manager of a representative Canadian interurban railway: "I might say, in conclusion, that the volunteer system of recruiting has reached its limit in Canada, and if the war is to continue much longer, we look for conscription here. We would like to see the recommendation of your President prevail in regard to this matter."

Many of the electric railway companies, in common with other Canadian industries, have contributed liberally to patriotic and Red Cross funds for the benefit of wounded and returned soldiers. Also, as has been previously mentioned, a consistent endeavor is made to provide men that have returned from the front with suitable positions. In this the electric railway companies have done their share in the work of absorbing these men into the ordinary activities of civil life with a minimum of confusion.

Some munitions have been manufactured on a relatively small scale in electric railway repair shops that are large enough to permit portions of the buildings to be turned into plants for this purpose. None of the average-size electric railways, however, is sufficiently well equipped with shop facilities to permit such work, although it appears to be conceded that by doing such work the electric railways could be of considerable service to the government.

The more important interurban railways have been used from time to time by the government for the movement of troops. For this service the government pays 2 cents per mile per soldier. The city railway systems, however, have apparently been used not at all for the transportation of troops or munitions.

Creating Passenger Traffic

Chicago, North Shore & Milwaukee Railroad Is Actively at Work Originating New Travel by Means of Special Trips and Electric Line Tours

VERY recently the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., carried 1179 school teachers over its lines to the Great Lakes Naval Training School, located about 25 miles north of Chicago, where the officers in charge had arranged for their entertainment with drills, boxing bouts, athletic events, sham battle, landing expedition, etc. The interesting thing about this from a traffic point of view is that the excursion was worked up in about two weeks' time, that only $30 in advertising literature was spent, and that the teachers came from as far as 250 miles in all directions around the training station. There were fifteen car loads from Chicago alone and several car loads from Milwaukee, Racine and Kenosha, Wis. A six-car special train was run over the elevated structure in Chicago to the Sixty-third Street and Stony Island Avenue terminus to accommodate the teachers from Michigan City, Hammond, Gary, Whiting and other cities south of Chicago. Eight cars were started at the Water Street stub terminal in the central business district of Chicago and one car was run through from Oak Park over the elevated and north. As the result of talks in Kenosha and Racine by F. W. Shappert, traffic and industrial agent for the North Shore Line, who is singularly responsible for the success of the trip, the commercial clubs and a few local concerns provided funds to send the teachers from their cities, and one car was chartered for the former and two for the latter city. In addition to the success of the immediate trip, other traffic is anticipated as a result of this excursion, since several of the principals told Mr. Shappert they would be glad to charter cars to take their schools to see the training station.

This is only one of many plans Mr. Shappert has in course of preparation to create new passenger travel over the North Shore Lines. A few weeks ago he secured a contract from the government to transport nearly 800 troops and their equipment from Fort Sheridan to Milwaukee, and has since been receiving considerable of the recruit movement to Fort Sheridan and the Great Lakes Naval Training School. Now, plans are being developed to offer to the public a number of attractive summer tours by way of electric lines and arrangements have already been completed with the Pere Marquette boat line across Lake Michigan from Milwaukee through F. C. Reynolds, vice-president and traffic manager, for through fares and advantageous connections to summer resort points in Michigan. Negotiations with other boat lines are also under way. Better time and a cheaper rate can be made from Chicago to Michigan resorts by way of the electric line to Milwaukee and across the lake to Ludington than by the steam lines around the foot of the lake. The Pere Marquette has assigned twelve staterooms a day to the North Shore Lines so that through accommodations may be assured. Co-operation with the hotels in Wisconsin and Michigan and general distribution of North Shore time tables and printing of the latter in the Pere Marquette steamer folders are expected to encourage new traffic.

The circle tours under consideration include the trip to Milwaukee over the electric line and across the lakes and back by way of Michigan, Ohio and Indiana electric railways. Special excursions from Wisconsin points to Starved Rock, Ill., and the Sand Dunes on the south shore of Lake Michigan, etc., are also planned.

Mr. Shappert is going into these detail arrangements very thoroughly with the view of being able to guarantee to the patrons of the electric line all accommodations promised throughout their trips. The possibilities for increasing the passenger traffic by these special trips and interchange with other lines have not been touched, according to him. With his former steam railroad experience to guide him, he says that the principal thing the matter with the electric railways is that they do not work together to use each other enough. The only discouraging thing about such a trip as the school teachers took is that the distance of travel is comparatively short and the revenue resulting amounts to only hundreds of dollars while thousands of dollars are almost as easily gained on a steam line through the longer haul possible. But the possibilities per mile of track are no greater and with co-operation as the keynote of his activities, Mr. Shappert is going ahead to solicit interchange with other electric lines in no small measure to produce a greatly increased electric line passenger traffic.

Preparations for Shortage of Food and Labor

Many Electric Railways Have Encouraged Practical Patriotism by Offering for Cultivation Their Rights-of-Way, as Well as Other Land That They Own—Employment of Women in Various Capacities Is Under Consideration by Many Railways

MARKED activity on the part of electric railways has been in evidence during the past week in response to the recent appeal of Herbert C. Hoover, who was until recently chairman of the Belgian Relief Commission and is now head of the American Food Board. "The total stock of food available to-day in the allied world," said Mr. Hoover, "is simply not sufficient to last until next September if America continues her present rate of consumption. The only hope of supplying the deficiency is by elimination of waste and by actual, rigorous self-sacrifice on the part of the American people. We must also plant everything and plant it everywhere it will grow, or next year the food problem will be absolutely unsolvable, and the world will face absolute starvation."

KANSAS INTERURBANS ENCOURAGE TRUCK GARDENS

The alarming situation thus outlined has met with a prompt response by many interurban railways of the Middle West. The Arkansas Valley Interurban Railway, which runs through a typical agricultural district, is planning to get much of the 52 miles of right-of-way between Hutchinson, Kan., and Wichita, Kan., planted in alfalfa. This will probably be raised and harvested by farmers who own abutting land. The company may plant part of the right-of-way itself, using construction gangs, which will thus be kept in employment after the completion of the present stress of work in ballasting the line. It is believed that such work will keep construction gangs intact, since many of the men are former farmers. Two of this company's substation agents, who live in quarters above the substations, are cultivating about 5 acres apiece of the right-of-way, their wives assisting in the gardens.

The Strang Line, between Kansas City and Olathe, is allowing employees to use the right-of-way for gardening, and a total of about 5 miles at various points along the line is under cultivation this spring. In several instances section men have gone into partnership to cultivate such tracts. In two cases persons not employed have been given the privilege of using the right-of-way for gardens. The company has provided implements for plowing the land for its employees.

The Missouri Short Line, between Excelsior Springs and Kansas City and St. Joseph, is permitting employees and farmers to use the right-of-way for crops. The management, while regretting the destruction of sod upon its right-of-way, believes that the use of this land will attract attention to the necessity for intensive cultivation of adjoining ground.

The Bonner Springs Lines has made contracts with owners of adjoining lands, whereby they use the right-of-way for crops at a nominal rental. The crops are chiefly forage, and stipulation is made that no growths shall be high enough to obstruct the view from trains. Much of the right-of-way is now planted in alfalfa and clover under such contracts.

Wherever outsiders are allowed to use rights-of-way the arrangements are made from year to year. Managers believe that the desire this year to get good crops will result in effective efforts by the users in keeping the weeds down.

Not all of the interurban operators in the Kansas City district favor turning over their rights-of-way for cultivation. "We have spent seven years getting a stand of sod along our right-of-way, and we don't want to sacrifice this grass while 26,000 acres of land within a mile of the right-of-way is lying idle," said one manager. "People would come miles to use a corporation's land if it was given free, passing right by other land that is better adapted to cultivation and more convenient to cultivate.

"In the cities, and especially in the suburbs, there are hundreds of thousands of acres that are not used at all, or yield only a scant pasture. Such land is usually being held for speculation. In numerous cases farmers or city men own pasture lands that supported a few years ago five or ten times as many cattle as are kept on it now. Cattle are scarce and high and excess grass is not harvested. Additions of hundreds of acres yield only weeds.

"Farther from the large cities the interurbans encounter a different situation. The farms hug the town limits closely and all the ground is usually well cultivated. The smaller towns also are largely relieved of the danger that confronts the large-city interurban in letting down the bars to trespassers."

TRUCK GARDENING ON OTHER ELECTRIC RAILWAYS

A feature of the plan of the Northwestern Ohio Railway & Power Company to encourage employees in raising their own garden products on the company's unoccupied land is an arrangement that has been made with a canning company whereby all vegetables thus grown will be purchased at the market prices.

More than 300 employees have taken advantage of the Brooklyn Rapid Transit Company's offer of its vacant land for cultivation. Nearly half of this number is made up of men in the mechanical department. In some of the locations planting has already begun, and in nearly all the preliminary clearing work is under way. In a recent notice to employees Colonel Williams, president of the company, stated that the trucking department had on hand a considerable amount of fertilizer which could be used, and that instructions had been given to convey this to the land that had been allotted free of expense to the employees.

On the Reading Transit & Light Company's property the plan has been followed of carrying out farm work by a co-operative arrangement between the employees. The company has turned over 40 acres of land to its men and this has been laid out in lots of 80 ft. x 100 ft. A committee of employees experienced in farm work is supervising the operation. The company has plowed and harrowed the land and is furnishing all the seed that is necessary.

A competition has been inaugurated among employees of the Indianapolis & Louisville Traction Company, whose land is being offered free of cost to employees for use for gardens. Prizes will be given for the best results. John E. Greeley, general manager of the company, has sent letters to all employees urging them to enlist in the "more-food" movement. In part the letter states: "The company owns many small tracts of ground along its line which will be offered without charge to any employee, and in connection with this the following prizes will be offered by the company: First, $20 in gold to the employee producing the best bushel of potatoes on ground owned by the company; second, $15 in gold for the best bushel of potatoes produced by an employee on any ground; and, third, $10 in gold to the employee having the best truck garden containing, among other things, any three of the following: tomatoes, beans, peas, beets and onions. The garden must be on ground owned by the company and not less than 50 ft. square." No two prizes will be given to one person, and in order to compete for the prizes an employee must hand in a contest entrance blank by May 15.

A feature of general interest in this movement has been the recent action of the Merchants' Association of New York. This organization is urging by circular that all employers should make an effort to transfer men from factories to farms during part of the summer in order to relieve the scarcity of farm labor that may be expected at that time. The plan is to contribute the time of any employees who are willing to undertake the work by giving them vacations under part or full pay for two or four weeks. Part of the men's pay will, of course, be covered by the wage of $1 per day that the average farmer may be expected to pay for help during the crop season, and it is pointed out that the employers may expect to benefit indirectly since short crops and excessive food prices will tend greatly to increase factory labor costs, while an abundant food supply will aid in keeping factory wages at a normal level.

EMPLOYMENT OF WOMEN BEING CONSIDERED

A number of electric railways have taken actively under consideration the matter of employing women for services where the physical labor is light. None has yet been employed in connection with the present shortage of labor on electric railways, but the use of women to release male employees has begun already on several steam railroads, notably the Pennsylvania, on which line an elaborate investigation is under way, while at the same time a number of clerical positions have been opened for the first time to women. On the Delaware, Lackawanna & Western Railroad, also, the beginning of a substitution of women for men ticket agents has taken place.

The plans of the Interborough Rapid Transit Company, which is now conducting an investigation on the subject, provide for the employment of women only as fast as men are drafted into military service. On the Boston Elevated Railway, according to a statement made by H. B. Potter before the Massachusetts Public Service Commission, the probable emergency created by the enlistment of employees will be met, if necessary, by the employment of women as conductors. It is expected that 1500 employees of this company will be drafted under the conscription act. Mr. Potter stated that the company had made an effort in Washington to have its motormen exempted from conscription, but that this had failed.

Women probably will replace men as conductors on Kansas City cars when the first million men shall have been called to the colors. An investigation is at present under way by the Kansas City Railways Company with a view to being in a position to make such changes as may be necessary for the adaptation of the company's service to the exigencies of the anticipated conditions.

NOTES ON WAR-TIME CONDITIONS

The United Railways of Baltimore has made every effort to encourage patriotism on the part of its employees, and as a result no less than ninety-nine of the men in the company's service are under arms. The men have been drawn from every department and have joined the colors in practically every arm. The National Guard infantry regiments have naturally attracted most men, but the company is represented also in the Naval Reserves, the Coast Artillery, the United States Aviation Corps, the Navy, the Marine Corps, the Cavalry and the Reserves.

On March 28 the company's executive committee adopted a resolution, which later was ratified by the stockholders, to the effect that every man now in the employ of the company who enters the service of the army or navy of the United States, either as a volunteer or under call, will be paid his full wages during his active service with the government, less his government pay, and will be given employment by the company on his return.

The firm of Stone & Webster, Boston, Mass., recently addressed the members of its organization in regard to the action that the personnel should take in the present national emergency. It is considered that a uniform decision on the question is impossible because of personal conditions and duties vary with each individual. Attention is called to the fact that the company's organization offers two opportunities for service: First, in the operation of the company's public utilities, which must be continued to permit the various communities to carry on their work, and, second, in connection with the very considerable amount of engineering and construction work which must be performed by the government with more than ordinary rapidity. The company has submitted a letter to the government offering the services of the company's organization for engineering and construction work at cost.

A plan for facilitating small subscriptions to the government war loan has been presented to 1000 Chicago firms by H. M. Byllesby & Company. This organization offers the facilities of its bond department without charge, and also offers to supply subscription blank cards, without advertising matter, suitable for inclosing in pay envelopes to employees, who thus may have the war loan called to their attention. Advertisements are being published by all of the public utility properties under the company's management urging popular subscription to the war loan and offering such subscriptions without charge. These properties serve communities with nearly 2,000,000 population in the West and South.

A most comprehensive scheme of protection for the property of the Brooklyn Rapid Transit Company has been organized under Capt. A. R. Piper, United States Army, who is general freight agent of the company. The principal features of this plan include the establishment of city policemen outside of power houses and substations and the use of watchmen inside of these buildings and at all vital points during twenty-four hours of the day. Searchlight towers have been provided at power houses in such positions that the entire yard and buildings may be covered. The yards also have been cut off by wire fences, and windows near the street and monitors on roofs where overlooked by adjoining buildings have been screened with heavy wires. Rules for visitors have been made particularly stringent, admission being granted only to those personally known to the men in charge. The entire list of employees has been carefully investigated and records of aliens searched. When any question as to the integrity of any employee has arisen the matter has been referred to the local police department for investigation. The police department has been asked also to pay particular attention to conduit manholes and to strategic points where extensive damage might be caused. It is considered, however, that this danger is diminishing.

In regard to the question of exempting electric railway employees from military service, Captain Piper states that he considers this unnecessary, and that it is advisable not to make any exception of electric railway employees, although it would, of course, be impossible to say to what extent the companies were going to be affected by the conscription law until definite age limits had been decided on by Congress.

Physical protection for company's property has been provided on the Toledo Railways & Light Company by a military company formed among the cadet engineers. This squad is being drilled by an army officer and will be used temporarily to guard the company's property; it includes the company's baseball team, and an endeavor will be made to have the men go to the front in the same organization if this is feasible.

WAR CONDITIONS IN LIVERPOOL

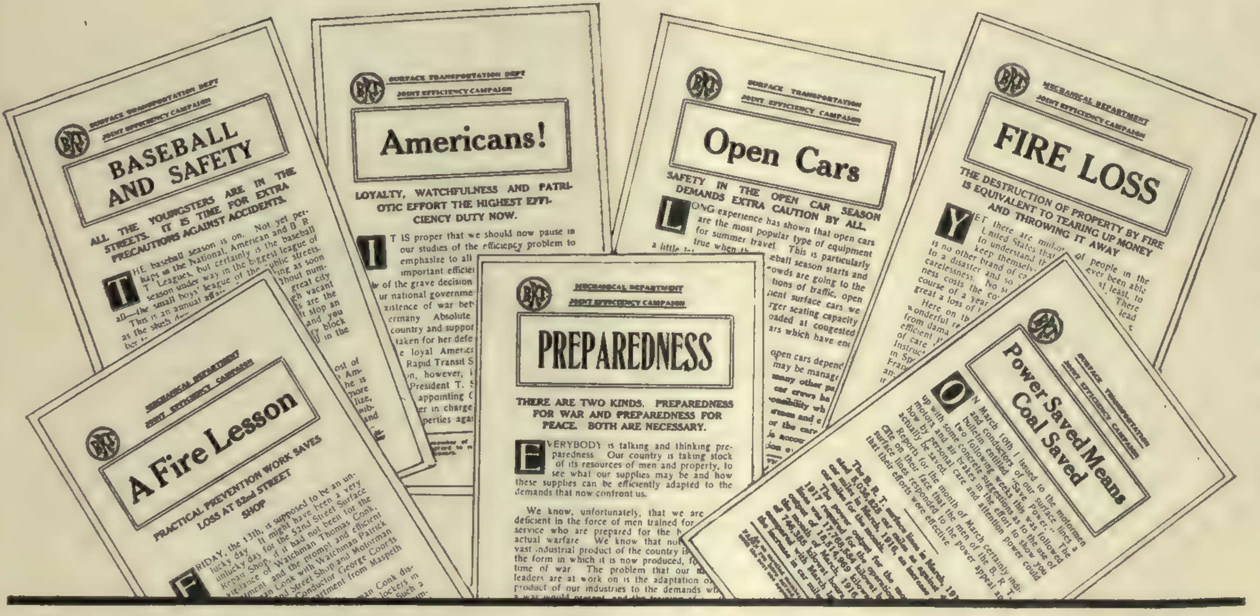
The annual report of C. W. Mallins, general manager Liverpool Corporation Tramways, for the calendar year of 1916 gives several interesting facts in regard to the conditions on that system brought about by the war. In the first place, Mr. Mallins reports that the increase in traffic experienced on other British tramways has taken place also in Liverpool. The number of passengers carried in that city in 1916 was 157,636,595, as against 150,755,680 in 1915, and the car mileage 12,688,163 as against 12,682,018 in 1915. Last year was the record for traffic on the Liverpool tramways, and operations were carried out under very strenuous conditions, owing partly to the difficulty of obtaining supplies and partly to the depletion of the staff, as out of 2700 men no fewer than 1900 joined the forces. Of this number 100 have fallen at the front. The vacancies created by employees joining the colors were filled, as far as possible, by men incapable of military service or by women. This latter class of labor, the general manager adds, has performed its duties as well as could have been expected under the circumstances, and the majority of the traveling public has shown admirable toleration of the conditions. The present staff consists of 1311 male and 1405 female employees.

Safety Medals Presented

The American Museum of Safety last week informally presented the several safety medals which are usually presented at the formal annual meeting. This year on account of the war conditions the usual meeting was omitted and in its place an informal luncheon was held, attended by representatives of the recipients and of the museum. Details regarding the award of these medals have been given in earlier issues of the ELECTRIC RAILWAY JOURNAL.

The Board of Public Utilities of Los Angeles, Cal., has compiled data showing that it would take 11,480 Ford touring car jitney buses to handle the rush-hour traffic handled by 700 cars of the Los Angeles street railways.

Recent Bulletins in the B. R. T. Joint Efficiency Campaign



BASEBALL AND SAFETY

ALL THE YOUNGSTERS ARE IN THE STREETS. IT IS TIME FOR EXTRA PRECAUTIONS AGAINST ACCIDENTS.

Americans!

LOYALTY, WATCHFULNESS AND PATRIOTIC EFFORT THE HIGHEST EFFICIENCY DUTY NOW.

Open Cars

SAFETY IN THE OPEN CAR SEASON DEMANDS EXTRA CAUTION BY ALL.

FIRE LOSS

THE DESTRUCTION OF PROPERTY BY FIRE IS EQUIVALENT TO TEARING UP MONEY AND THROWING IT AWAY

PREPAREDNESS

THERE ARE TWO KINDS. PREPAREDNESS FOR WAR AND PREPAREDNESS FOR PEACE. BOTH ARE NECESSARY.

A Fire Lesson

PRACTICAL PREVENTION WORK SAVES LOSS AT 52nd STREET SHOP

Power Saved Means Coal Saved

The efficiency campaign which has been under way for several months on the Brooklyn Rapid Transit System is acting to co-ordinate the interest and activities of the men of all departments. As stated in an article in the issue of the ELECTRIC RAILWAY JOURNAL for March 24, nearly 95 per cent of the motormen and conductors are enrolled in the campaign and are reading the bulletins systematically. The reproductions above are from the title pages of some of the latest bulletins.

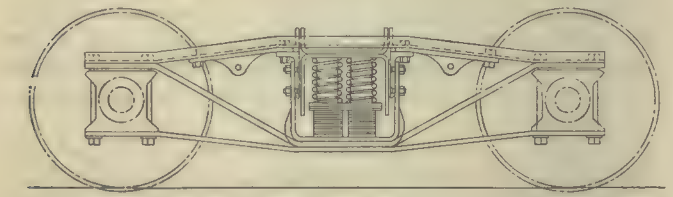
COMMUNICATIONS

Equalizer Bars Not Necessary

L. B. STILLWELL, CONSULTING ENGINEERS
NEW YORK, April 27, 1917.

To the Editors:

I was very much interested in the article on truck equalization, in your issue of April 21, by S. A. Bullock, and though agreeing with him on the necessity of distributing the center plate load equally on all four wheels of the truck, I take the position of disagreeing with him in his conclusions as to the best method of securing the desired result. All will agree that it is obviously impossible for the four wheels of a truck always to remain in the same horizontal plane. The inevitable inequalities of the roadbed and other factors cause constant changes of the relative elevation of the wheels. Consequently, to permit of this relative movement of the wheels and axles sufficient flexibility of the truck as a whole must be provided.



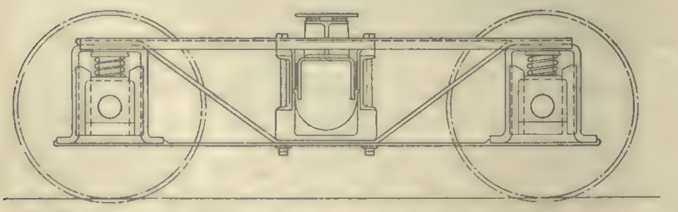
TRUCK EQUALIZATION—FIG. 1—PLAIN ARCH-BAR TRUCK WITHOUT SPRING LINKS, USED FOR LOW-SPEED CITY SERVICE

The successful operation of the large number of trucks of the plain arch-bar type shown in Fig. 1 of Mr. Bullock's paper is ample evidence that sufficient flexibility for the purpose of equalization is provided therein. The same may be said of all of the other types illustrated.

The type of truck with equalizer bars shown in Fig. 4, which is advocated by Mr. Bullock, commands respect due to its age rather than to its specific characteristics and operating record. With this design the incorporation of unnecessary weight in trucks is manifestly uneconomical—just as is the incorporation of unnecessary weight in steel cars.

Mr. Bullock's stated objections to the type of truck illustrated in Fig. 3, which has springs directly over the journal boxes, are answered by the operating record of this design. Such trucks are giving very satisfactory service under severe operating conditions as well as under cars where clearances are extremely limited.

Also, Mr. Bullock's statement that efficient equalization requires a spring base less than the wheelbase was apparently made without consideration of the tilting of truck frame which follows brake applications. The smoothness of stop accomplished from high speeds in the case of cars fitted with trucks having springs directly over the journal boxes is a feature worthy of consideration.
F. M. BRINCKERHOFF.



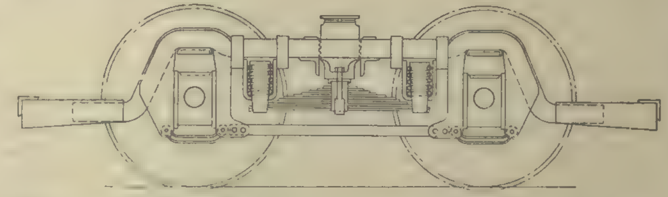
TRUCK EQUALIZATION—FIG. 3—HIGH-SPEED DESIGN HAVING SPRINGS OVER BOXES INSTEAD OF EQUALIZER BARS

THE PENNSYLVANIA RAILROAD COMPANY
ALTOONA, PA., April 28, 1917.

To the Editors:

After reading Mr. Bullock's article on truck equalization, it occurs to me that he has entirely overlooked some of the fundamental principles of truck design in trying to favor the use of equalizer bars. No doubt every designer will agree that it is desirable that all trucks be equalized in some manner. But other statements made by Mr. Bullock should be proved by him, or will have to be taken as merely his personal opinion. Some of these statements are as follows:

1. "The manufacturer has in some cases eliminated the equalized construction and substituted a frame of rigid design, similar to the old arch bar.
2. "There are two objections to the design of truck with springs over the journal boxes: First, it is not properly equalized, and, second, it requires undue space over the journal box for its application.
3. "Efficient equalization requires a spring base less than the wheelbase."



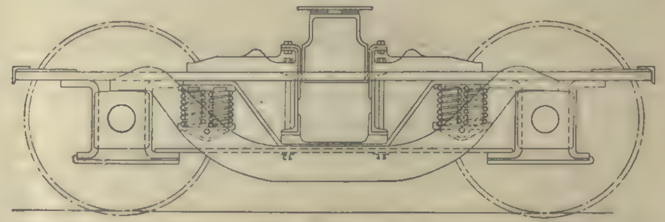
TRUCK EQUALIZATION—FIG. 2—DESIGN FOR CITY SERVICE PERMITTING FREE TRANSVERSE MOVEMENT OF BOLSTER

With regard to the first statement it may be said that the earliest four-wheel trucks of which we have knowledge had frames consisting of two longitudinal beams supported on the ends of the two axles, and a transverse beam supported on the centers of the longitudinal beams. The three beams were not firmly tied together. In such trucks the equalization was as perfect as in any modern truck; in fact, the equalization had to be perfect, as the roadbed at that time was much farther from perfection than any modern roadbed. The absence of truck springs resulted in hard riding qualities.

In analyzing trucks the equalization and spring gear must be considered separately, even though the deficiencies of one may be compensated by the other. The truck described above, though primitive, had an equalization which was fundamentally perfect but, lacking springs, rode hard. On the other hand, if the truck frame and transom is a solid non-flexible casting, supported directly on the journals, and the car body is supported on very flexible springs, the car may have easy riding qualities, but on bad track the truck will derail.

Clearly, therefore, track conditions govern equalization, and riding qualities govern the spring gear.

The arch-bar truck used in freight service is not a rigid design, as implied by Mr. Bullock in his comments on the design shown in Fig. 1. Each side frame is really an equalizer between the two axles. The tie between the two frames consists of a wide channel, applied flatwise directly under the bolster. The resulting truck



TRUCK EQUALIZATION—FIG. 4—TYPICAL EQUALIZER-BAR CONSTRUCTION FOR HIGH-SPEED INTERURBAN SERVICE frame is sufficiently flexible for any irregularity of present-day track surface, and is at least as flexible, in view of the transom design indicated, as that of Fig. 4, which has typical equalizer-bar construction.

The springs of the freight truck are cheap, and have but a small range of deflection. Trucks as shown in Fig. 4 have two sets of springs—one set of elliptic springs and one set of helical springs—in addition to bolster suspension, permitting bolster side motion. The better riding qualities are due only to the greater range of spring action and to the possible bolster side motion—not to equalization. If the freight truck, like Fig. 1, were provided with springs equivalent to those commonly used in trucks like Fig. 4, and if the bolster were suspended from hangers, the freight truck would have riding qualities equal to those ascribed to Fig. 4.

With regard to the second and third statements quoted after the first paragraph, I may say that the spring base of a truck should not be short, especially on cars with one brakeshoe per wheel. Tilted trucks under brake application illustrate the reasons for such statement. With non-flexible transoms between truck frames, the spring flexibility should increase in direct proportion to the distance of the spring from the transverse center line of the truck. If, however, the two side frames are held merely in parallel planes and are connected by a transom very flexible against torsion, it is immaterial whether the springs are over the boxes or between the boxes. Placing them over the journal boxes has the advantage of reducing the non-spring-supported weight of the truck, thereby reducing the hammering and consequent distortion of the rail at joints.

In all of the trucks to which Mr. Bullock refers, irregular track will cause torsion strains in the transom, requiring transom flexibility, or in lieu thereof spring flexibility between the truck frame and journal boxes. If, in trucks with stiff transoms, the spring flexibility is derived from springs with a spring base of, say, three-quarters of the wheelbase, the springs may have less flexibility than if they are placed over the boxes when compensating for track irregularities. But the springs should have the same flexibility for good track.

All this goes to show that equalization can be accomplished equally well in any existing type of truck and that springs of sufficient flexibility for comfort can be, and are, applied under the bolster and over the journal boxes. Consequently, the designer is free to select that type which can be produced for least weight and cost.

W. F. KIESEL, JR.,
Assistant Mechanical Engineer.

[NOTE.—Owing to the several references as made above to the illustrations published with Mr. Bullock's article of April 21, these have been reproduced herewith with their original captions.—EDS.]

Good Watches and Uniform Loading

HAMILTON WATCH COMPANY
LANCASTER, PA., April 30, 1917.

To the Editors:

I noticed with interest the editorial comment in your last issue on watch inspection. If the use of accurate watches by trainmen means as much as we think it does in the way of better service and more rapid schedules, and as you also seem to think, a very few dollars more for a good watch is a small price to pay for the resulting advantages.

I realize that when a railroad man has to purchase his own uniform and badge, and then a $20 to $25 watch in addition, it may seem somewhat of a hardship, but from a matter of dollars and cents it is a good economic proposition. When once railway men experience the satisfaction of owning a good watch I think they will not have any objection to the initial outlay. But if they do, practically every jeweler will be glad to sell a railroad man on time, particularly if the street railway company gives indorsement to the men's purchases.

When one considers that there are some 225,000 miles of railroads in the United States under official time inspection and that the railroad men all over this vast mileage are buying watches on this same basis, and for the most part buying a much higher grade and consequently more expensive watch than the street railway man would buy, it would seem only the natural thing to expect the railway men in the electric railway service to equip themselves with this same efficient safeguard.

ROBERT E. MILLER.

AMERICAN ASSOCIATION NEWS

Committee on Rules

S. W. Greenland, Fort Wayne, Ind., and W. C. Callaghan, Norwich, Conn., of the T. & T. Association committee on rules, conferred in New York on April 26 with reference to possible changes in the rules. They concluded to recommend that no changes be made this year.

Committee on Libraries

A meeting of the committee on libraries, appointed at the mid-year meeting of the executive committee of the American Association in Boston, was held in New York on April 23. The function of this committee is to consider the promotion of electric railway libraries and the possibility of utilizing the association office as a clearing house for information regarding them. At the New York meeting it was decided to collect information regarding company library practice for use in framing a preliminary report.

The committee comprises L. A. Armistead, librarian Boston Elevated Railway; I. A. May, comptroller The Connecticut Company; C. C. Mullen, chief of the inspection bureau Pittsburgh Railways; R. H. Johnston, librarian Bureau of Railway Economics, and C. W. Stocks, statistician American Electric Railway Association. At the meeting were Messrs. Armistead and May, of the committee, and E. B. Burritt, H. C. Clark and A. Shapiro, representing the association. The committee will meet again at an early date.

Preparedness Program at Hartford, Conn.

The Connecticut Company section held its regular monthly meeting on April 25 at Hartford with 282 members and guests present, the record attendance so far. A program appropriate to the times was carried out as follows: Hal Fullerton, director of agricultural development, Long Island Railroad, spoke on "Agricultural Preparedness or How to Keep the Market Basket and the Haversack Filled." This was an illustrated talk explaining some of Mr. Fullerton's accomplishments in the line of agricultural preparedness achieved on his 22-acre farm on Long Island. Hon. George B. Chandler, compensation commissioner of the State of Connecticut, under the title "Preparedness and Transportation," explained in detail how transportation companies will form a vital link in rendering patriotic service in time of war. Major Frank Macomber, president Hartford Chamber of Commerce, spoke on "More Food Through Better Salesmanship." He offered several suggestions as to how the officers and employees of the Connecticut Company can spread among the farmers the gospel of proper marketing of their products, and said that an agricultural department or bureau might be established by the company.

Practical and Economical Solutions of Problems in

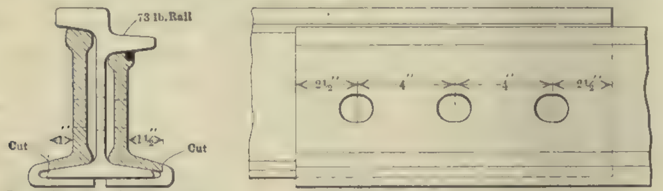
EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Economical and Effective Method of Repairing Old Rail Joints

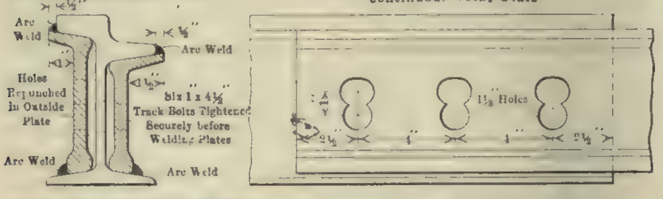
BY R. H. FINDLEY
Superintendent Track and Roadway Omaha & Council Bluffs Street Railway

In rehabilitating some of the old track in Omaha, Neb., in order to get a few years' more service out of it, a method of repairing the joints which has proved to be very effective and at the same time involves an expenditure per joint which is commensurate with the short additional life expected has been used on approximately 250 joints to date. The rail in this track is 73-lb. section No. 291 Lorain Steel Company tram rail with 26-in. continuous rail joints which have been in service about thirteen years. In rebuilding these joints, the joint plates are removed and taken to the company shop, where the portion of the plate which extends under the base of the rail is cut off in a shaper. The plates are then repunched and put back on the joints, but inverted. They are then bolted in place and electrically welded along the top and bottom edges with an Indianapolis welder. The angle of the top and bottom faces of the plates and that of the rail are very nearly the same, so that the plates fit snugly when put on in this inverted position. By putting the bottom of the rail joint under the head of the rail the plate projects ½ in. beyond the head on the outside and an equal amount beyond the tramway on the inside, so that it is possible to weld with the arc. In the normal position it would practically be impossible to weld the plate underneath the head. The welding is carried along the complete length of the joint plates, giving four lines of electrical and mechanical contact.



Cross-Section showing Old continuous Joint Plates

Elevation of One-Half of Old Outside continuous Joint Plate


½"
Arc Weld
⅛"
Arc Weld
1"
Holes Repunched in Outside Plate
1½"
Six 1 x 4½" Track Bolts Tightened Securely before Welding Plates
Arc Weld
Arc Weld
1⅛" Holes
2½"
4"
4"
2½"

Cross-Section showing Application of Old Joint Plates after Cutting off Base, Inverting and Arc Welding to 73 lb. Rail

Elevation of One-Half of Inverted Outside Plate after Cutting off Base, showing Punching of Holes

DETAILS OF RAIL JOINT REBUILT BY REVERSING PLATES AND WELDING

The new holes, punched in the plates to line up with the holes in the rail, overlap the old ones slightly. But inasmuch as the welding prevents movement of the plates relative to the rail the function of the bolts is not so important, and further there is no weakening of the web in the longitudinal direction in which the greatest stress occurs.

The cost of the joint, including the expense of tearing up and replacing the pavement at the joint, the labor of cutting off the base of the plates and repunching them, the installing and welding, and the cost of six new bolts and about 7 lb. of welding metal per joint, has averaged less than $4.50 per joint. A more permanent weld with new splice bars, such as the Lorain electric weld or the Thermit weld, is considered too high in cost to warrant its use in repairing this old track. And since the web of the rail has become less than ¼ in. thick it is considered of insufficient weight and strength satisfactorily to take a heavier weld. Where the head of the rail is cupped out at the joint it is built up with the welder. As soon as completed all joints are rough-ground with a home-made grinder and are later finished with a reciprocating grinder. The cost of this work is included in the above figure.

Single-Truck Cars Remodeled Into One-Man Type

Other Kansas City Railways' Modernization Work Includes Splicing Two Single-Truck Cars to Form One Double-Truck Car

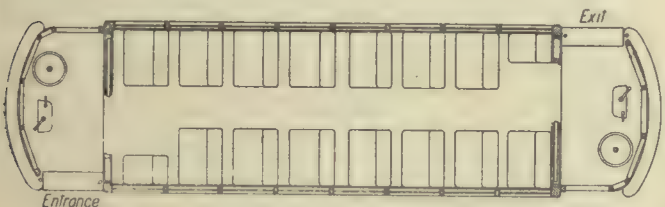
The remodeling of surface cars is being undertaken in the shops of the Kansas City Railways as rapidly as the requirements for heavy traffic will permit. The modernization comprises the rearrangement and refitting of the interior, the redecorating of both interior and exterior and, with some cars, the actual reconstruction from the trucks up, to the extent of splicing two single-truck cars to form one of the double-truck type. During the past year 1200 cars of all types were repaired at the shops, where $600,000 is being spent annually.

The work of converting old single-truck cars into cars of a one-man-operation type is being carried on at present at a cost of about $600 per car. The reconstruction includes the laying of a new floor, the replacement of the front bulkhead by an arch, and the formation of an opening of increased size in place of the rear bulkhead doors. Two new vestibule doors are being installed at the front and rear of the car, both on the curb side. The rear door, for use in emergency only, is held closed by a folding seat and opens automatically when the seat is raised. A buzzer alarm circuit extends from the rear to the front platform. All of the seats were set crosswise in the old car, but half of these are now being replaced by longitudinal seats, one of which is shortened to allow free access to the combined entrance and exit, where the doors and steps of the folding design will be installed. In front of the longitudinal seats are installed four stanchions.

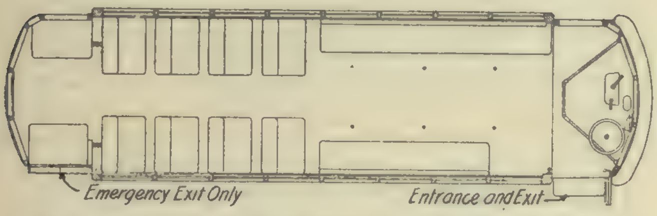
The seats themselves are washed and varnished by a machine which restores them to their original appearance. The former wood siding is replaced with steel.

The operating equipment in the rear end of the car is removed and the rear platform made part of the main car, while in the front end a railing is placed around the motorman's position, where fares will be collected by the motorman-conductor, who also operates the cars without changing position, although for the convenience of passengers fare boxes may be installed. The register equipment is being converted into a double register so that it may be used by the motorman-conductor or by an additional conductor if one becomes necessary.

As previously stated, the rear platform by being raised 9 in. is made part of the main car floor, necessitating a step at the emergency door. Another addition to the rear is an electric tail-light outfit.



FLOOR PLAN OF SINGLE-TRUCK CAR BEFORE REMODELING



FLOOR PLAN OF SINGLE-TRUCK CAR AFTER REMODELING

One of the heaviest pieces of remodeling was that undertaken a few years ago when fifty double-truck cars were made by splicing 100 single-truck cars. Cuts were made at the second windows or about 5 ft. from one end of the single-truck cars, which were 21 ft. over the body, or about 5 ft. from the ends, making the completed new body 32 ft. 7 in. in length. The seating arrangement consisted of longitudinal and cross-seats. A longitudinal seat was placed at each end on opposite sides, and the cross-seats were arranged in like manner, thus giving plenty of aisle room. Each car cost approximately $1,500. The cars have given general satisfaction and have proved sufficiently large on heavily taxed lines.

Dustless Ash Removal

A recent issue of the *Electrical Review*, London, contained a description of a system of ash removal by the employment of which the conveying of the ashes is done under water.

Below the boilers is a concrete conveyor trough partly filled with water. The chutes leading from the ash hoppers under the boilers dip below the surface of the water in the trough, thus forming a dust seal. The conveyor scoops are linked closely together and are carried by rollers running on rails mounted on the top of the trough. A third rail on the bottom of the trough, in the middle, prevents the conveyor from rubbing on the bottom.

The delivery end of the trough is inclined upward to retain the water in the trough and to provide a chute for delivering ashes to cars conveniently located outside the boiler room.

Asbestos and Varnish Make Good Field-Coil Insulation

This Combination Is Particularly Effective Where Motors Are Subjected to Severe Overloads, but Present Price of Asbestos Makes Method Expensive

BY F. J. FOOTE
Master Mechanic Ohio Electric Railway, Columbus, Ohio

The specifications for winding and insulating field coils which were given in the March 17 issue of the ELECTRIC RAILWAY JOURNAL, in the article on motor maintenance at Providence, were of special interest to me, since I have given a great deal of attention to the subject and like to know what others are doing.

Where the motors are not overloaded the method described for insulating the field coils should give excellent results. The writer believes firmly in the modern method of impregnating in a vacuum, where possible, but if the specifications mentioned in the article are carefully carried out this should insure about as long life to the coils as is secured by impregnating. Where the motors are required to carry heavy overloads, however, I have found by costly experience that oiled linen and cotton webbing, while giving excellent insulation to start with, soon disintegrate from the heat, and break down.

Because of excessive overloading of certain motors I was compelled, several years ago, to do something to keep the field coils in service longer, and my attention was called to the possibilities of using asbestos tape with insulating varnish only. At first this did not appeal to me, on account of the well-known low insulating value of asbestos. However, a careful investigation of some old motors having field coils thus insulated, which had been standing up under excessive overloads, was convincing, and the following specifications covering the insulation of strap-wound coils were made up, and have been followed for some time:

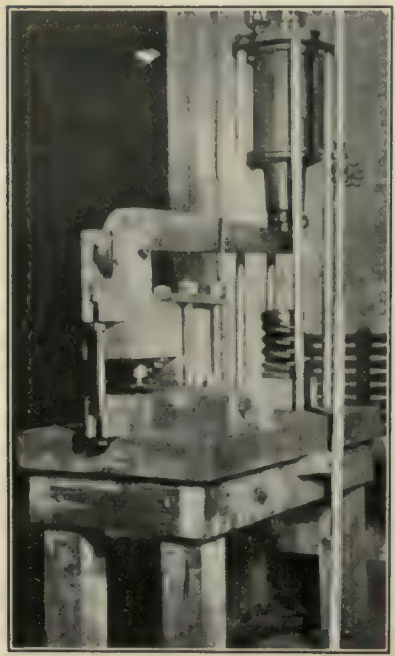
1. Wind coil sections with asbestos paper insulation between turns; put on terminals.
2. Put sections together with ⅛-in. asbestos paper or board separators.
3. Bind sections together in place with a few turns of cheap open-weave webbing.
4. Heat coils in oven over night to remove moisture, and in the morning dip while hot in insulating varnish.
5. When dry enough to handle remove the temporary webbing. Wrap with one layer of close-weave, medium-weight asbestos tape, not overlapped.
6. Dip in insulating varnish.
7. When dry enough to handle wrap with a second layer of the same grade of asbestos tape one-half overlapped.
8. Dip in insulating varnish. Drain, and bake over night in oven.

By this process the asbestos tape is thoroughly impregnated. This is an important feature, for as was pointed out some time ago in an A. I. E. E. paper by B. G. Lamme, chief engineer Westinghouse Electric & Manufacturing Company, the heat is transmitted largely through the varnish, regardless of the kind of tape used.

I have found that this method of insulating gives by far the best results of any method yet tried where the motors must operate at a high temperature. The specifications which I have given apply only to strap-wound fields, as we do not undertake to rewind any round-wire fields. We have, however, reinsulated some of our old wire-wound fields by this method. Unfortunately, the present condition of the markets prevents us from following the above specifications, but as soon as asbestos is again within reach we expect to have all fields insulated in this way.

Home-Made Air-Operated Punch

BY G. B. SISSON
Mechanical Department Georgia Railway & Power Company, Atlanta, Ga.



AIR-OPERATED PUNCH WITH HEAVY SPRING WHICH ACTS AS A SHOCK ABSORBER

Recently we had a line department job of punching 18,000 holes in the braces of pole-top fittings. To do this our master mechanic, J. E. Eaves, rigged up a pneumatic punch out of an old 8-in. brake cylinder. This punch is operated at 80 lb. to 100 lb. pressure per square inch and will punch holes up to 9/16 in. in diameter in rough stock ½ in. thick. It will turn out the work ten times as fast as it could be done by drilling, and it also saves the cost of the drills. The punches are interchangeable.

The pressure exerted on the lever is so powerful that the punch goes right through the stock, and in order to prevent its being stopped with a shock the spring shown under the air cylinder in the accompanying illustration is provided to catch this lever and act as a shock absorber.

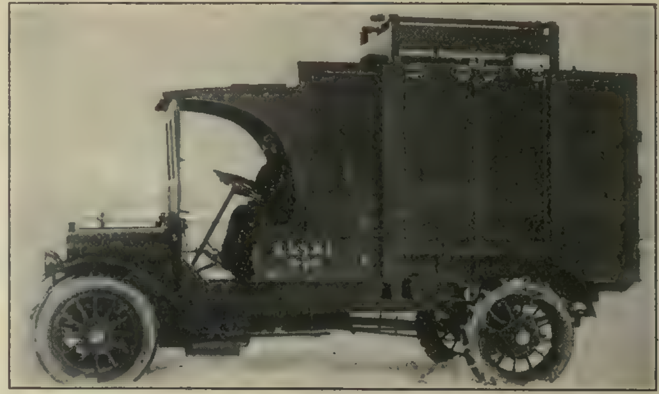
The controlling mechanism is made from a globe valve changed to act like a whistle valve. This is operated by means of a pedal. The punch has been found to be a convenient tool, and it paid for itself on the first job on which it was used.

Sea Air No Tonic for Gulfport Cars

The interurban cars of the Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., are being put through the Gulfport shops for a general overhauling. Because of the proximity to the salt water the equipment on this road is more than ordinarily subjected to the effect of damp air, and for this reason special protective measures are being taken. The road does a city and interurban service along the coast of the Gulf of Mexico in the southern part of Mississippi. Its tracks are parallel to the gulf shore and for nearly 20 miles are laid within 200 ft. of the water's edge.

In overhauling the cars new yellow pine creosoted sills are being installed which before installation are treated with a brush coating of Barrett's refined "Carbosota." The wooden sheathing of the cars is being removed, the framing repaired where necessary, and the cars are being newly plated with steel panels.

According to W. F. Gorenflo, general manager, the proximity to the ocean and consequent dampness makes it almost impossible to maintain composition ceilings in the cars. For this reason during the reconstruction new steel ceiling plates are being installed, and these are being covered with white enamel. The seats in the cars also are being recovered with Dupont fabrikoid. After the completion of the shop work the cars are painted a yellow color, slightly darkened with umber, except the letter boards, which are painted red.



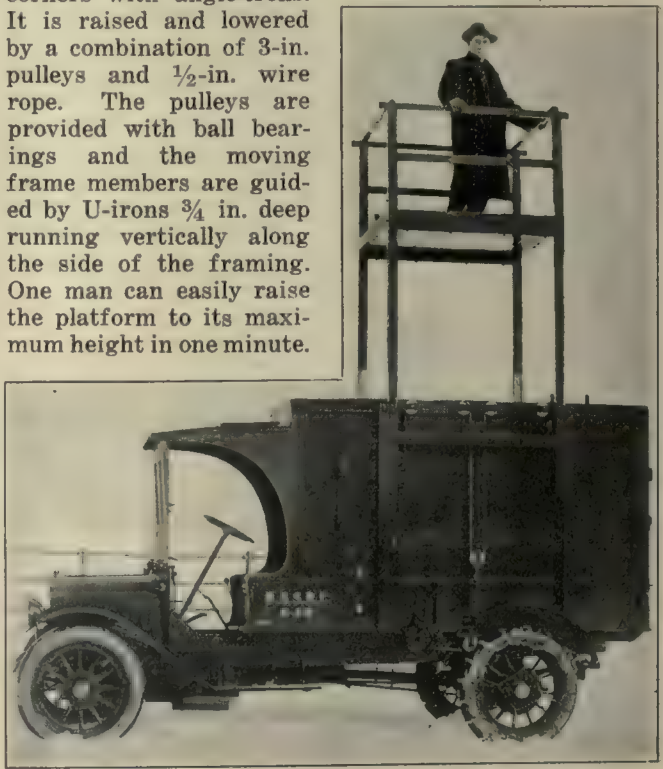
NEW BAY STATE TRUCK WITH PLATFORM LOWERED

New Tower Truck of Compact Type

Compactness and Availability of Entire Interior of Body for Materials and Tool Storage Are Features of This Bay State Truck

Three motor-driven tower trucks of an unusually compact type have recently been placed in service on the Bay State Street Railway, the design having been made by Frank M. Spicer, general line superintendent of the company, Boston, Mass. The equipment consists of a special body, a platform and supports carried on the chassis of a standard General Motors Company ¾-ton truck, driven by a four-cylinder gasoline engine. The platform has a total lift of 4 ft. 6 in., and when lowered and folded is carried at a height of only 9 ft. above the ground. When extended it reaches a maximum height of 16 ft. A notable feature is the availability of the entire interior space of the truck for carrying tools and supplies.

The body of the truck has sides of hard pine sheathed with leather and supported by 2-in. by 1½-in. oak posts, spaced about 10 in. apart and forming a stiff frame. The working platform, 4 ft. 6 in. long by 3 ft. 8 in. wide, is carried on four similar posts reinforced at the corners with angle-irons. It is raised and lowered by a combination of 3-in. pulleys and ½-in. wire rope. The pulleys are provided with ball bearings and the moving frame members are guided by U-irons ¾ in. deep running vertically along the side of the framing. One man can easily raise the platform to its maximum height in one minute.

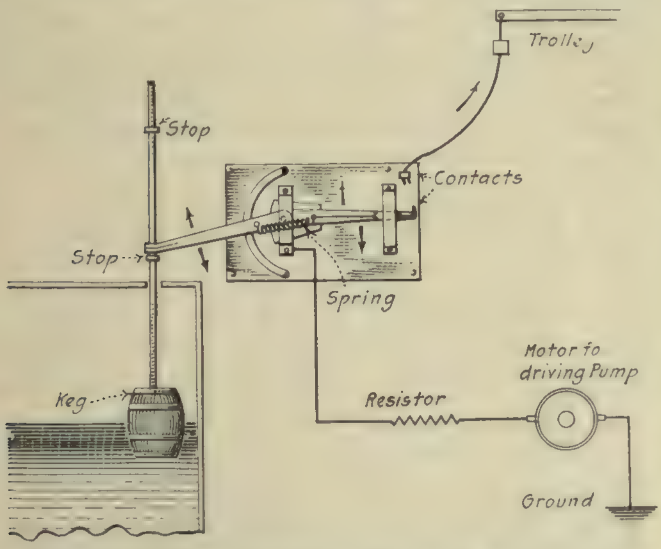


NEW BAY STATE TRUCK WITH PLATFORM RAISED

The platform is held at any desired point by a pawl which is unlocked in lowering by means of a hand lever also attached to a band brake nearly encircling the winding drum, so that the lowering is gradual and handled without danger of over-speed. The use of a central traveling pulley results in uniform application of force in raising the platform and in controlling its descent. The platform and its supporting posts weigh about 500 lb. Lockers with outside doors are provided in the sides to save trips around the end of the truck to get small tools and supplies from the interior, and the roof of the hood is provided with a hatch about 18 in. square, so that the driver can observe a man at work on the platform and, if desired, pass up tools and supplies without leaving his post. The trucks are used in signal maintenance and other light repair work as well as on the overhead system, and are capable of being operated at speeds of from 25 to 30 m.p.h. Access to the top is provided by fixed iron-ladder rungs on the side of the body, and hooks for a portable ladder are also provided.

Home-Made Switch to Operate Sump Pump

A satisfactory method of automatically draining a low place on a right-of-way has been in operation for some time on the Inter-Urban line, Des Moines, Iowa.



APPARATUS FOR AUTOMATIC CONTROL OF MOTOR-DRIVEN SUMP PUMP

A regular bilge pump could not be installed to give satisfactory operation on account of the poor voltage regulation on both the alternating-current and direct-current circuits at this point. As a substitute an old GE-1000 motor is belt-connected to a pump, and the outfit is covered over with a small housing. The motor is cut in and out automatically by the apparatus shown in the diagram, a small shellac keg of 1 cu. ft. capacity being used as a float in the well of the sump. This operates a vertical rod equipped with two stops which actuate a lever connected by a coil spring to a knife switch which makes and breaks the motor circuit. As the keg forces the arm over past the center position, the direction of pull of the spring is changed until the lateral component is sufficient to throw the switch arm over and operate the switch.

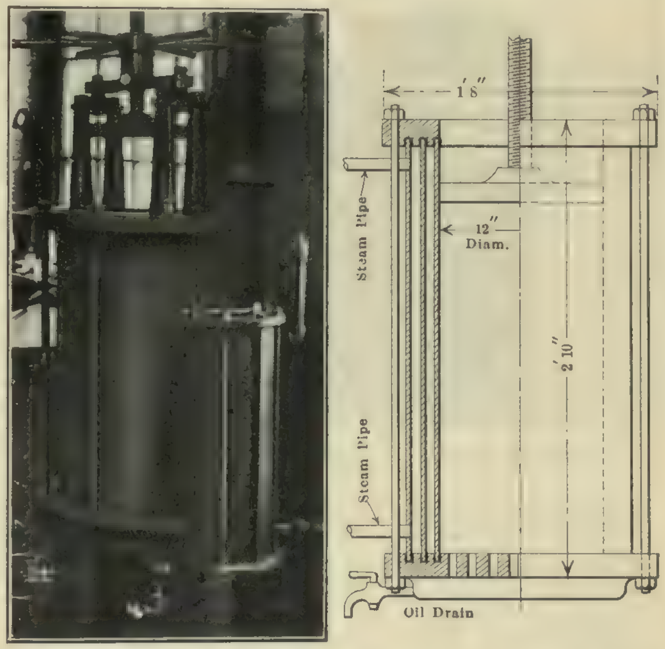
A study of the stock transfer records of the Cities Service Company, New York, N. Y., brings out the interesting fact that the company now has 11,183 stockholders. Of these 4232 or 38 per cent are women.

Reclaiming Waste and Lubricating Oil

Steam-Jacketed Press and Filter Used in Buffalo, N. Y., Effectively Cleanse Waste and Remove Grit from Oil

In the Cold Spring shops of the International Railway, Buffalo, N. Y., a steam-jacketed waste press and a steam-jacketed oil filter are doing splendid service at a practically negligible cost. Dirty, oily waste put through the former comes out practically as good as new, the oil being melted and squeezed out. In the filter the oil is rendered more fluid by the heat of the steam jacket, and the grit and dirt brought over from the waste press are left behind in cheesecloth and perforated screen sieves. The use of this equipment produces a saving of about 65 per cent of the oil and the waste is practically all recovered.

The details of the apparatus are shown in the accompanying photograph and line drawing. The oil press consists of a cylinder and a compressing piston. The cylinder is made of three pieces of steel pipe, 30 in. in length and respectively of standard 12-in., 14-in. and 16-in. sizes. They are held in compression between two thick cast-iron heads by means of six bolts extending from head to head. The ends of the pipe fit into grooves turned in the faces of the heads, the joints being packed with lead. The outer annular space forms the steam jacket, steam pipes being tapped in at the top and the bottom respectively through the outside shell. The inner annular space is the oil well, and it connects with the bore of the cylinder by means of numerous perforations in the inside pipe.



STEAM-JACKETED WASTE PRESS AND STEAM-JACKETED FILTER IN SHOPS OF INTERNATIONAL RAILWAY—DETAILS OF CYLINDER OF WASTE PRESS

The bottom head is perforated and below it is a galvanized iron pan which acts as an oil reservoir. A stop cock tapped into this permits the reclaimed, dirty oil to be drawn off from time to time. The cylinder is supported on strap iron legs attached to the bolts previously mentioned.

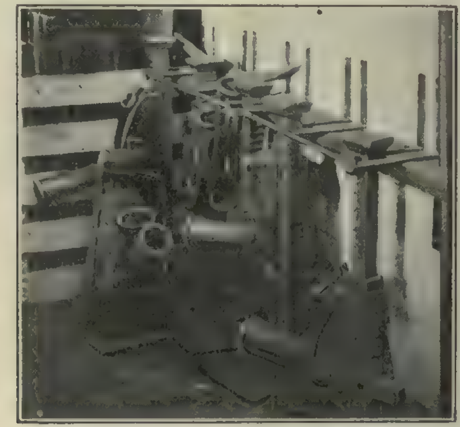
The piston is driven into the cylinder by means of a spoked nut traveling on the threaded piston stem, mounted as shown in the photograph.

The filter is of the same general construction as the cylinder of the press but is smaller. It is made of three pieces of steel pipe, 6 in., 7 in. and 8 in. in diameter respectively and 24 in. long. In the center is a screen of brass wire of the finest mesh obtainable. Over the screen are two layers of cheesecloth. The screen can be removed from the filter by means of a bail.

The equipment described above is located in the boiler room at the shops where steam can be conveniently obtained. It is operated by the boiler tender whose procedure is to allow a barrel of oily waste to accumulate and then to put this quantity through the press at one time. This can be done in two or three hours, the main consumption of time being in waiting for the oily waste to become heated through.

Rack for Jacks in Emergency Car

Crews on emergency cars are sometimes hard pressed to find a convenient space for jacks. On a new emergency car completed by the Union Street Railway, New Bedford, Mass., the jacks are carried in the rack shown in the accompanying illustration. A 4-in. x ½ in. wooden bar is attached to the side of the car, and the jacks are held rigidly against this bar by two rods ½ in. in diameter. To release the jacks it is necessary only to unhook these rods. This rack while simple in construction has been found convenient and serviceable, and there is no danger of a jack's falling upon any member of the emergency car crew.



CONVENIENT RACK FOR HOLDING JACKS

Washing Cars Instead of Sweeping Them

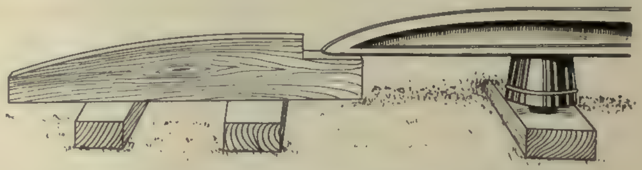
The practice of flushing cars with water instead of sweeping them has been found in Des Moines, Iowa, to expedite the cleaning and to be satisfactory provided the cars are suitably prepared. The thorough cleaning of cars was formerly done by women using hot water and "Gold Dust," and one steam-heated bay of the carhouse with a capacity for twenty cars was utilized for this purpose. Under the present plan one truck of a car is run up on a hose jumper so that there is about a 4½-in. difference in height in the two ends of the car. One man then goes through the car with a hose and thoroughly flushes the floor, starting from the high end, and another man follows him through with a broom and sweeps the water and dirt out of the car as quickly as possible.

In order to make this scheme practicable, the heater ducts were raised 3 in. or 4 in. above the floor, the air compressor governor was installed in a cabinet in the front bulkhead and all obstruction possible to the free flow of the water and free movement of the broom was removed from the floor. By handling the hose carefully and sweeping the water out promptly the company has experienced no trouble from water leaking through the trapdoors into the motors or getting into the air governor.

The same scheme is used in washing the car exterior, using the hose and a brush, and washing with plain water. By this means it has been possible to save 80 per cent of the time formerly required to wash a car, and there are sixteen to twenty cars washed per day on the Des Moines property.

A Guard for Third-Rail Approaches

Trouble is sometimes caused by faulty third-rail shoes getting below end approaches and thus breaking the insulators and tearing up the rail. The accompanying sketch shows how this is prevented on one railway property by a wooden block placed in front of a third-rail approach and securely nailed to the ties. Sufficient clearance is left between the ends of the block and the rail to allow for the expansion of the latter. It has been found that no real harm results if the block accidentally comes in contact with the rail since the leakage is small even in wet weather.



GUARD TO PREVENT THIRD-RAIL SHOES FROM GETTING UNDER THE RAIL

A Catenary Hanger with But Five Parts

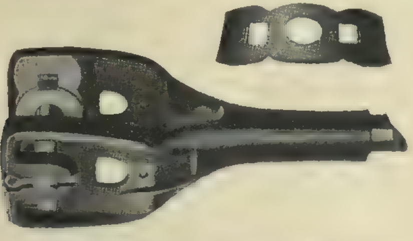
The Westinghouse Electric & Manufacturing Company has placed on the market the hanger illustrated on page 380 of the issue of the ELECTRIC RAILWAY JOURNAL for March 3, 1917. As stated in the article describing the construction of the new Buffalo-Niagara Falls high-speed line this hanger is being used on that line. It is to be known as type NF and contains five parts; bolt, nut, washer, hanger rod and clamp.

The hanger rod consists of a ⅜-in. steel rod with an oblong loop at the upper end for attaching to the messenger cable. After the hanger is in place this loop can be closed very easily. At the lower end of the hanger rod is a loop with a round opening for connecting to the clamping bolt. The clamp is made in duplicate parts of malleable iron. In the design the lips of the clamp were made with minimum thickness to secure satisfactory operation with wheel trolleys, and the nuts and spring washer were so located that when the groove of the trolley wheel is worn to the maximum depth there will be no tendency for the flange to strike the bolt. The hanger is suitable for standard grooved-section trolley wire from No. 00 to No. 0000, and its average weight for 150-ft. spans is 1 lb. All parts of the hanger are sherardized.

FIVE-PIECE CATENARY HANGER

New Contact Spring for Trolley Harps

The accompanying illustration shows the Kalamazoo trolley harp and the new design of springs with which they are being equipped by the makers, the Star Brass Works, Kalamazoo, Mich. Since the springs are not riveted to the harp, renewals can be readily made without removing the pole from the car. The contact surfaces are large, thus giving a good current capacity and adding to the life of the pins and bushings.


CONTACT SPRING FOR TROLLEY HARPS

Oxy-Acetylene Welding Practice in Des Moines Shop

Different uses to which oxy-acetylene gas can be put in an electric railway shop are constantly being discovered by M. M. Lloyd, master mechanic Des Moines (Iowa) City Railway. On the new low-floor cars in Des Moines the gear cases have a clearance of only 2 11/16 in., and hence they often strike a stone or other obstruction on the roadway. This may make a dent in the case, and then the gear teeth cut a hole. The accompanying illustration shows a gear case with such a hole in it and one in which a similar hole has been quickly and easily repaired by welding a patch over the hole.

Worn center bearings on Westinghouse D2EG and D3EG air compressors are built up by the welding process. The babbitt is first taken out and the bearing filled in with metal to a depth of ½ in. or ⅝ in., after which the compressor case is placed in a drill press and the bearing housing bored out and fitted with a brass bearing. Worn journal side-plate bearings are also built up. The bearing way is filled and the journal is put on a planer and squared up, thus renewing the journal for a long period of service. The maintenance on the door-operating handles on a number of the cars was materially reduced by welding. These handles were previously riveted or held to the vertical rods with set screws, and trouble was constantly experienced by their breaking off. To remedy this they were permanently welded in position.

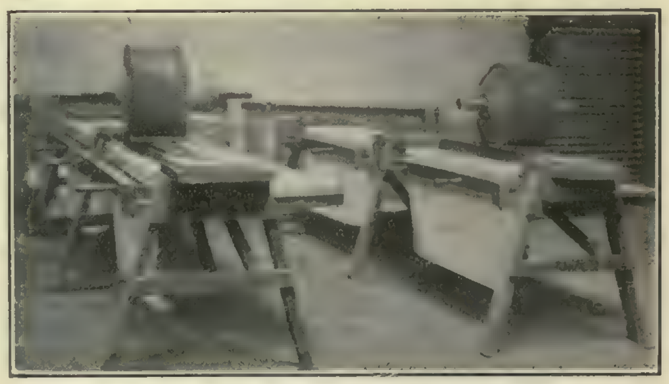
PORTABLE ACETYLENE GENERATOR IN DES MOINES SHOP; AT TOP, PRESSED-STEEL GEAR CASES, DAMAGED AND REPAIRED

The oxy-acetylene cutting frame was used to good advantage in a case in which it became necessary in the reconstruction of an electric locomotive to cut the door in the operating cab 5 in. wider. This meant the cutting of the ¼-in. steel side sheet through a vertical distance of 6 ft., and it was done readily with the acetylene flame, whereas it would have been a considerable problem to accomplish cutting by mechanical means.

The portable oxy-acetylene generator shown in the accompanying illustration is employed. Whenever a heavy casting or a particularly difficult piece of welding is to be done, it has been the practice to preheat the piece by the use of a home-made coal-oil burner connected with the shop air-pressure system.

Curtain Printing Press Used at Nashville

At the shops of the Nashville Railway & Light Company, Nashville, Tenn., of which George W. Swint is master mechanic, a printing press has been built for lettering destination sign curtains. By the use of this press the cost of the work is said to be reduced and the results obtained are uniform.


FOUR-SECTION PRESS FOR PRINTING DESTINATION SIGN CURTAINS

As shown by the illustration, the outfit includes four sections alike in arrangement. Each section consists of a narrow table somewhat longer than the width of a sign curtain. The sides of the table are equipped with clamps so that the cloth to be printed may be stretched over the bed of the table and held tightly in place. The signs are printed on sections of cloth each 44 in. long, and a wooden silhouette letter is used. The letters are cut out of white pine blocks and mounted on boards of uniform length so that they may be stored in racks near the press.

A combination of printers' ink and drop black is used for printing. When the type has been inked and laid in place on the cloth, an old armature core is rolled over the back of the type in order to press it firmly against the cloth. By means of the four sections of this press four similar curtains are printed at one time, the sets of type being moved from one section to the other as the cloth is moved along in each of the presses.

The largest smokestack in the Illinois River valley is being erected by the Illinois Traction System at La Salle, Ill., to serve the rebuilt power plant of the Northern Illinois Light & Power Company. This stack will be 265 ft. high and 16 ft. in diameter at the base. It is being constructed of steel, with brick lining.

News of Electric Railways

Traffic and Transportation
Financial and Corporate Personal Mention Construction News

Dallas Charter Amendments Upheld

Court of Civil Appeals Upholds Election at Which Charter Was Amended, Making Possible Transit Settlement

The Court of Civil Appeals of the Fifth District of Texas has upheld the validity of the city election of April 4, 1916, at which the charter of the city of Dallas was amended to authorize the granting of indeterminate franchises and the model service-at-cost franchises were approved. As a result J. F. Strickland and C. W. Hobson are free to accept the electric light and traction franchises voted by the city of Dallas, Tex., on April 3, 1917. Messrs. Strickland and Hobson have ninety days from April 3 under the terms of the franchises in which to accept them. In view of war conditions and pending settlement of the injunction proceedings against the enforcement by the city of the initiated ordinances adopted at the last city election, Messrs. Strickland and Hobson say they may ask the city for an extension beyond the ninety-day period.

The contention of attorneys for the traction and lighting interests is that at least one of the initiated ordinances is in conflict with the terms of the franchises in that it prohibits the raising of rates without the approval of a majority of the voters of the city, whereas the franchises provide for increases in rates under the London sliding scale. Another ordinance providing for the installation of safety devices is held to be covered in the franchises as granted.

The traction and lighting franchises are affected by the charter amendments in that the amendments provide for a service-at-cost plan in lieu of the 4 per cent gross income tax, as provided in the charter. By being forced to pay the 4 per cent tax, the grantees claimed they could not have accepted the franchises, which provide that all profits of more than 8 per cent shall be used in reducing fares.

The contest of the election on April 4, 1916, attacked the authority under which that election was held and also sought to have it declared illegal because of certain markings on the ballot appearing as explanations of the amendments and franchises to be voted on. The court found no grounds for contest of the election and declared it legally conducted. If the decision had been in favor of the contestants the authority for holding the election would have been lacking and the results of the election void. This would have voided the charter amendments and the franchises.

Senate Passes Commission Bill

New York State Body Favors Measure Based on Recommendations of Chairman of Legislative Investigating Committee

The Senate of the State of New York on May 1 passed the bill introduced by Senator George F. Thompson of Niagara providing for the reorganization of the Public Service Commissions of the State. The bill was drafted as a result of the investigation of the commissions made by the legislative committee of which Senator Thompson was chairman. Under the provisions of the Thompson bill the present Public Service Commissions would be divided into three divisions, namely, one so-called hearing division composed of three commissioners to conduct hearings and make decisions and two regulatory divisions each made up of three commissioners, one for New York City and one for the rest of the State. The headquarters of the hearing division and the up-State regulatory division would be at the State Capitol, while the activities of the public service corporations in Greater New York would be supervised as at present from headquarters in New York City. The powers of supervision over the construction of new subways exercised at present by the Public Service Commission for the First District in Greater New York would under the Thompson bill be turned over to a rapid transit commissioner, after the present work has been completed. The appointment of the rapid transit commissioner is placed with the Governor. This provision has been assailed as a violation of the home rule principle. The measure will now go before the Assembly. Should it be passed there and then be approved by the Governor, the Public Service Commissions as at present constituted would be succeeded by the new order of things on June 30.

Union Terminal for Los Angeles

Pacific Electric Railway, Southern Pacific Company and Salt Lake Railroad to Combine Entrances to City

The Southern Pacific Company, the Salt Lake Railroad and the Pacific Electric Railway, it is announced, will in a few days begin work on the reconstruction of the entire trackage layout on which they enter the heart of Los Angeles, Cal. Briefly summarized, the plans are as follows:

1. Merging of the Southern Pacific and Salt Lake station accommodations at the new Southern Pacific station, Fifth Street and Central Avenue.

2. Abandonment of Alameda Street by the Southern Pacific, except for local switching to industrial establishments.

3. Joint use by the Southern Pacific and the Pacific Electric of the Salt Lake Railroad right-of-way on the east bank of the Los Angeles River.

4. The construction of a bridge across the Los Angeles River and an elevated track from the Los Angeles River to the rear of the Pacific Electric station at Sixth and Main Streets, with branches connecting with the Arcade station and the Wholesale Terminal Company's $10,000,000 establishment.

5. Reconstruction of the freight yards on the east side of the river and establishment of a new industrial district, where five big manufacturing plants, including a cotton mill, steel mill and other industries will be located.

The objects which are sought to be achieved are:

1. To effect a virtual union station arrangement; permanently anchoring the railroad stations, or union terminal, in a central location.

2. To eliminate as far as possible all grade crossings in the heart of the city, and to eliminate from the congested west side of the river the freight and passenger traffic, and to pave the way for a union freight classification and switching yards on the east side of the river.

3. To provide a shorter entrance without grade crossings to the heart of the city for both the steam roads and the Pacific Electric Railway high-speed trains.

Under the proposed arrangement the Pacific Electric Railway will bring its trains into Los Angeles by way of the Salt Lake Railroad right-of-way, the inside portion of which will be leased for ninety-nine years, and will cross the Los Angeles River between Sixth and Seventh Streets, on an elevated track, which will be continued from the river up through the middle of the block, between Sixth and Seventh Streets, to connect with the present elevated structures at San Pedro Street. The cost of the new work has not been made public. It is expected that the new route will permit the Pacific Electric Railway to reduce the running time over its line between Los Angeles and Pasadena by twelve minutes.

Santa Fé Electrification Rumors

Edward P. Ripley, president of the Santa Fé system, was in San Francisco, Cal., recently as the head of a party of directors and officials of the company. During his stay there the question of possible electrification of some of the lines was raised. Mr. Ripley is reported to have said:

"The time for any definite statements is not yet ripe. Nothing has been offered us as yet which would give us an opportunity to go ahead with any actual plans. It is true, however, that overtures have been made, and if we can see our way clear profitably to do so we will electrify divisions of the Santa Fé lines."

One of the party stated that a plan had been submitted to dam the Colorado River 21 miles north of Peach Springs, and to generate electricity from that source. This gentleman is reported to have said:

"It is natural that with the ever increasing price of oil we are figuring on some way out. Electrification seems to be the only way. But the cost of electrifying has always been so enormous that the railroads could not see their way clear to pay for the investment in a reasonable time. But if someone can make us a proposition whereby the extraordinarily low cost of power would offset the cost of equipment the situation would be different."

With President Ripley were W. D. Hines, president of the board of directors; A. D. Juillard, director; W. B. Storey and W. E. Hodges, vice-presidents; A. G. Wells, general manager, and Ford Harvey.

Seattle Conferences Progressing

At a conference between representatives of the city of Seattle, Wash., and the Puget Sound Traction, Light & Power Company, held on April 25, virtual agreement was reached that an exchange of power should take place between the city's municipal plant and the plants of the company, in case of a break-down in either system. A. W. Leonard, president of the company, promised to submit a schedule of rates for such emergency service as soon as they could be ascertained.

A proposal to operate cars of the Puget Sound Traction, Light & Power Company over Division "A" of the municipal railway system, from the south end of the Fremont Bridge to Third Avenue and Pine Street, in order to relieve the congestion of Westlake Avenue, and a proposal to construct a new line on Stone Way to accommodate the Seattle-Everett interurban cars, were the outstanding features of the conference. Six car lines and the interurban road are now operated over Westlake Avenue, as the only route to the district north of the Fremont Bridge, and by the utilization of Dexter Avenue, on which city cars are now operated, the congestion on Westlake Avenue would be relieved, and two direct avenues of traffic between the great district north of the canal and the downtown district would be made available. Mr. Leonard of the company expressed a willingness to consider the establishment of the proposed line on Stoneway for the accommodation of the interurban, and also promised to look into the maintenance of a new line to serve the district lying east of Woodland Park and between there and the Green Lake and Meridian lines.

Reconstruction of the Fremont-Ballard and Sixth Avenue Northwest lines on Leary Avenue, in order to avoid a multiplicity of right-angle curves in the existing routes, was discussed. A. L. Kempster, manager of the Puget Sound Company, announced that the company would be glad to make the change. The same attitude was expressed relative to the reconstruction of the Fauntleroy Avenue line on Avalon Way and Thirty-fifth Avenue Southwest, in order to eliminate dangerous crossings and the operation of cars over heavy grades.

Before the conferences being held between the city and the company are concluded, Councilman Erickson will propose a partial reconstruction of the street railway system in order to serve the industrial district in the vicinity of Harbor Island and the Duwamish Waterway, and lessen the congestion on downtown business streets. The plan has been partially worked out. It includes among other things a ferry and the building of street railway lines to carry passengers who will utilize the water routes.

Increase in Wages in Bangor

Twenty Per Cent Fund Established—Co-operative Committee Organization Launched

The Bangor Railway & Electric Company, Bangor, Me., has adopted the so-called 20 per cent fund as a basis of payment of wages to its trainmen. During the ten years ended with 1915 the company paid 17.7 per cent of its gross passenger earnings in wages to the motormen and conductors in the passenger service alone. The officers of the company have studied the subject and believe that the amount the company is able to pay for wages is limited to 20 per cent of the gross passenger earnings. They have therefore decided to use 20 per cent of the gross passenger earnings in payment of the wages of conductors and motormen, but in no event will the rates of wages be lower than the following: First year, 25 cents an hour; second and third year, 26 cents an hour; fourth year and thereafter, 27 cents an hour. As just stated, these are the minimum wages to be paid. Starting on May 1 the company began to set aside in a separate fund 20 per cent of its gross passenger earnings, and all payments of passenger conductors' and motormen's wages will be made from this fund. Any accumulations in the fund will be used to increase rates of pay as fast as the condition of the fund justifies. The minimum wage of 25 cents as now fixed is an increase of 1½ cents an hour over that previously in force.

The company has also proposed to the men the formation of a co-operative committee which shall be composed of two motormen and two conductors selected by them from their own ranks, the superintendent of transportation and the assistant general manager or such other representative of the general manager as he shall appoint. The representative of the general manager is to be chairman of the committee. This committee is to meet at least once a month to discuss ways and means to improve the service and the working conditions and wages. It is not intended to abridge the control of the officers of the company over employees or the management, but through this committee there will be an opportunity for the representatives of the men to keep themselves fully informed as to the measures which the company takes from time to time to maintain the discipline necessary to a safe and efficient service. The representatives of the men upon this committee are to have the right to appeal to the highest operating official of the company should they at any time have reason to doubt the fairness of any decision of the chairman of the committee.

Strike on Indiana Line

As a result of the work of union labor organizers the conductors and motormen of the South Bend city lines of the Chicago, South Bend & Northern Indiana Railway went on strike on April 29. About 117 men are affected by the strike order. During Sunday only ten cars were operated by the company and no attempt was made to operate after dark. Demands were made upon the company for increased wages, shorter working hours, recognition of the union, etc. Trainmen on the interurban lines of the company, operating from South Bend to Elkhart, Goshen, Laporte and Michigan City, Ind., and Niles, Berrien Springs and St. Joseph, Mich., refused to join the union of the city trainmen, but presented a petition as individuals for an increase of wages on a sliding scale from 27 to 35 cents an hour. There was no interruption in the interurban service.

The company agreed to meet a committee of the interurban men and consider their petition, but F. I. Hardy, general manager of the company, refused to consider any demands presented by the union. A proposition was, however, made to the striking employees that their demands for increased wages and shorter working hours should be presented by them as employees of the company, and that they should be considered by a board of arbitration selected by the Public Service Commission of Indiana. Fourteen cars were in operation on the South Bend city lines on April 30, and the interurban service was still uninterrupted. A mass meeting and parade of all the labor unions was held on the night of May 1 in an effort to secure public sympathy in the strike.

Washington Inquiry Started

Senate Appoints a Committee to Inquire Into Recent Strike—Company's Brief Submitted

The machinery of the United States Senate committee which will inquire into the strike of the employees of the Washington Railway & Electric Company has been set in motion. The committee is composed of five Senators. They are Messrs. Hughes, Pittman, King, Jones, and Johnson of California. Mr. Hughes is chairman. While the committee organized on April 22 the pressure of the other duties of the Senators in connection with the vast war work under way in Washington tended to delay materially the progress of the inquiry.

The company was quick to respond to the summons of the committee. It filed with that body on April 30 a general and sweeping denial of the alleged facts in the complaint of the strikers. The company denied that it was guilty of bad faith in submitting an individual contract to its employees. It also denied that it was trying to break up the organization of the employees, and that it secretly imported strike breakers while appearing to be willing to discuss a new agreement with the men. The reply went at length into the history of the company. According to the company dissatisfaction among the employees followed the formation of the local division of the Amalgamated Association. It is pointed out that the strike of 1916 was settled through negotiations between the company and a committee representing all employees and not merely union men. That the company refused to deal with the union was reiterated.

A brief in rebuttal to that filed by the company, it is expected, will be filed within a few days by James H. Vahey, counsel of the Amalgamated Association. As soon as the answer is received by the committee arrangements will be made for hearing the arguments.

Although the cases of the fifteen strikers charged with wrecking a car of the Anacostia line last month are still pending in Police Court, it is not expected they will be heard there. It is believed the grand jury will investigate the charge.

Obstructionist in Cincinnati

Injunction Sought to Prevent Issue of $6,000,000 of Bonds for Rapid Transit Construction

On April 26 Davis S. Oliver, acting as a taxpayer, amended his petition filed in Common Pleas Court in Cincinnati, Ohio, on March 31, and now seeks an injunction against the issuance of $6,000,000 of bonds or any part of the sum for the construction of the rapid-transit loop, and against the entering into any contracts for the construction of the loop under the terms of the ordinance passed by the Council and approved by the voters. The Cincinnati Street Railway, the Cincinnati Traction Company and the Ohio Traction Company are made party defendants with the city and the Rapid Transit Commission in the amended petition. Mr. Oliver argues that any agreement in accordance with the terms of the ordinance will result in the misapplication of the city's funds and the abuse of corporate power. He further claims that the law under which the ordinance was passed is unconstitutional.

It is possible that no street railway commissioner will be appointed until January, 1918, and the Council may not take action for some time yet in regard to salaries for the members of the Rapid Transit Commission, as provided by a law enacted last winter. Until bonds are sold, no funds will be available for this purpose. The members of the commission will in all probability manage the preliminaries through the remainder of this year without the aid of a street railway commissioner. Chief Engineer Krug estimates that the $40,000 remaining of the original appropriation of $100,000 will be sufficient to pay the engineering expenses for this year. The Council will undertake no legislation until requested to do so by the Rapid Transit Commission or the Mayor. A question has been raised as to just when the ordinance takes effect, but the consensus of opinion seems to be that it became effective when approved by the voters.

Mr. Reynolds' Memory Honored

New England Street Railway Club and Massachusetts Street Railway Association Pay Tribute to Deceased Bay State Official

A most unusual tribute to the memory of a street railway man occurred at the Hotel Somerset, Boston, on the evening of April 26, when members of the New England Street Railway Club and the Massachusetts Street Railway Association assembled in joint meeting in commemoration of Henry E. Reynolds, assistant general manager of the Bay State Street Railway, who died last month. About 200 members attended. Testimony to Mr. Reynolds' sterling worth, ability and capacity for friendship was borne by Clark V. Wood, president of the Springfield (Mass.) Street Railway; Matthew C. Brush, president of the Boston Elevated Railway; Robert S. Goff, vice-president and general manager of the Bay State Street Railway; Bentley W. Warren, counsel for the Massachusetts Street Railway Association, and P. F. Sullivan, president of the Bay State Street Railway. Appropriate resolutions taking Mr. Reynolds' life as an inspiration for future co-operation among workers in the street railway industry in New England were presented by a committee consisting of C. S. Clark, A. E. Potter and E. C. Foster. These embodied the expression of the ideals of a life of service and were unanimously adopted. The meeting was the first joint gathering in the history of the two organizations.

M. M. and M. C. B. Convention Abandoned

At a meeting on April 30 the officers of the American Master Mechanics' and Master Car Builders' Associations decided not to hold any convention this year. The abandonment of the exhibit feature was mentioned in the issue of this paper for April 21.

Bay Region Labor Troubles

An arbitration of the Key Route strike, as reported on page 761 of the ELECTRIC RAILWAY JOURNAL for April 21, resulted in allowing the men the hour schedule which they had demanded and which calls for twelve hours on and twenty-four hours off. This will increase the company's cost of operation about $40,000 annually, and to cover this increase the company is applying to the State Railroad Commission for permission to increase fares.

Later the engineers and deck officers of the ferryboats operated on San Francisco Bay by the Northwestern Pacific Railway and the Southern Pacific Railway demanded the same working hours that have been granted Key Route employees. No agreement between companies and employees could be reached on this score and the men announced that they would resign in a body at the close of business on Saturday night, April 28. Both railways therefore announced that the regular ferry service would be discontinued beginning Sunday morning. This threatened strike was averted at the last moment, however, by allowing the demands for twelve hours on and twenty-four hours off.

Coal a Problem in Cleveland

Cost of Fuel to Cleveland Railway $50,000 a Month More Than Formerly

Through Street Railway Commissioner Fielder Sanders, President J. J. Stanley of the Cleveland (Ohio) Railway presented a communication to the City Council on April 30 in which he called attention to the fact that the company's coal contracts had expired and that monthly contracts had been made at the best prices obtainable. Coal will cost the company practically $50,000 more a month than in the past and it will be necessary to increase the operating allowance sufficiently to cover this amount. Mr. Stanley estimated this increase at 1.16 cents per car-mile. It is not known just what the company is paying per ton for fuel on its temporary contracts.

Rumored Deal for Leavenworth-Topeka Line.—It is reported that Eastern capitalists are planning to take over the Leavenworth & Topeka Railway, the 47-mile steam line between Leavenworth and Topeka, Kan., which at various times has been reported about to be electrified. The line was operated by the Union Pacific and the Santa Fe, but is now in receivers' hands.

Increase in Pay on Inland Empire System.—E. E. Lillie, superintendent of the Spokane (Wash.) Traction Company, which is controlled by the Spokane & Inland Empire Railroad, recently announced that conductors and motormen of the Inland Empire system, including the city lines of the company, will receive an increase in pay. The amount of the raise will not be made public, however, until accountants, who now are at work, have submitted a report.

More Men Needed in Cleveland.—Fielder Sanders, street railway commissioner of Cleveland, Ohio, stated on April 19 that a number of cars had been taken off the lines on the east side of the city during the evening rush because men could not be secured to operate them. Mr. Sanders estimated that 150 additional men were needed, but Paul Wilson, secretary to President J. J. Stanley of the railway, said that the service could be greatly improved with the addition of fifty men.

Openings with Public Service Commission.—The Civil Service Commission of the State of New York has issued a circular describing examinations which will be held on June 2 for various positions on the Public Service Commission and other State departments. These include a junior electrical engineer for the Public Service Commission, First District, salary $901 to $1,200 a year, a special track work draftsman for the same commission, salary $1,501 to $1,800 a year, and a statistician in the State Department of Labor, salary $1,200 to $1,560 a year.

Increase in Wages in Spokane.—A material increase in the pay of trainmen of the city and interurban system has been authorized by the Washington Water Power Company, Spokane, Wash. The increase ranges from 2 to 6 cents an hour. It provides that men on the city system receive 28 cents an hour for the first six-month period, 29 cents for the second six months, 30 cents for the third six months, and 31 cents for the fourth six months. From that time to the twelfth year they receive 32 cents; for the thirteenth, fourteenth and fifteenth years, 33 cents, and after fifteen years, 35 cents.

Attorneys to Confer at Toledo.—It was announced on April 30 that D. C. Bailey, attorney for H. L. Doherty & Company, would be in Toledo during the week commencing April 30 to confer with the attorneys of the Toledo Street Railway Commission in regard to the wording of certain clauses in the community plan ordinance. At the last conference between members of the commission and Mr. Doherty the language of these clauses was left to Attorneys Johnson Thurston and Ralph Emery to arrange. Mr. Doherty later wrote that the forms suggested did not seem to cover the agreements reached.

Wage Negotiations at East St. Louis.—Negotiations are being conducted between the East St. Louis & Suburban Railway, East St. Louis, Ill., and its trainmen over the working conditions of a new contract to take the place of one which expired on May 1. The company says frankly that under present conditions it is unable to make an increase in wages sufficient to equal the increased cost of living, but has offered a considerable increase, as well as a bonus for any reduction made in the accident account over the average percentage for the four years ended June 30, 1916. It is expected that an agreement will be reached.

Motor Buses Proposed for Chicago.—The Chicago Stage Company, an Illinois corporation, backed by the New York Transportation Company, which owns the Fifth Avenue Coach Company, has made application to the Chicago authorities for about 60 miles of motor-bus routes over the boulevards and park systems there. The officers of the Chicago company are Richard W. Meade, president; Samuel E. Morrow, secretary, and George L. Willems, treasurer. These gentlemen occupy similar positions with the New York Transportation Company. In making application in Chicago the company has specified a 10-cent fare, has asked for a twenty-year franchise, and has agreed to guarantee minimum payments to the municipal authorities of more than $2,700,000. This is along the lines of the recent proposals made by the Fifth Avenue Coach Company for additional routes in New York City.

Rhode Island Committee Organized.—Zenas W. Bliss, chairman of the Rhode Island Tax Commission, has been made chairman of the special committee created by the General Assembly to investigate the affairs of the Rhode Island Company and offer financial assistance in the way of fare changes, if such changes are found to be just. The commission has notified the Rhode Island Company of its organization, and has requested the assignment of a date for a preliminary meeting, to map out the work. The other commissioners are William C. Bliss of the Public Utilities Commission and George H. Newhall, Bank Commissioner.

Toronto Men Request Wage Increase.—At a meeting of the Toronto (Ont.) Railway employees on April 28, it was decided to make a demand upon the company for an increase in wages of 10 cents an hour all around. The present agreement expires on June 15. Under the new schedule, a sliding scale, the union will ask for an increase from 26 to 36 cents an hour for the first year; 28 to 38 cents for the second year, and from 30 to 40 cents for the third year and thereafter. The men will urge a more uniform system of working hours, and they will also ask for a revision of several other clauses in the present working agreement.

Sympathy Strike in New Orleans Plants.—The employees of the power stations of the New Orleans Railway & Light Company, New Orleans, La., went on strike recently and hampered the company considerably for a time in rendering continuous service. The men aligned themselves in sympathy with their chief, Edward B. McKinney, superintendent of power of the company, in a personal controversy between him and the management, but returned to work after the issues in dispute had been explained to them at length by the company. Mr. McKinney has since been succeeded in his position by J. J. Chisholm, formerly superintendent of power of the Tennessee Coal & Iron Company, Birmingham, Ala.

Service Restored in Lincoln.—Conditions were practically normal again on April 30 with the Lincoln (Neb.) Traction Company, the trainmen of which went on strike on April 18. The company succeeded in operating about 55 per cent of its equipment the first day of the strike and has bettered this mark every day since then. By April 30 the full schedule had been established for daylight service. Since the third night of the strike there has also been a limited service after dark. New men are being recruited rapidly and the company expected to return to the normal eighteen-hour service by the latter part of the week ended May 5. The company is determined in its course not to recognize any union, and no union employees will be allowed to remain in its employ.

West Side Measure Passed.—The Green bill providing for an investigation of the proposed west side improvement contract between New York City and the New York Central Railroad, has been passed by the Assemby. The Green measure and another bill drafted by the Public Service Commission have been agreed upon as a solution of the west side problem. The Green bill provides for a commission of seven members to report its findings to the Legislature by Feb. 1, 1918. The Public Service Commission bill provides for concurrent action on the contract by the Board of Estimate and the Public Service Commission, and authorizes the commission to compel the railroad to execute its improvement plans in case an agreement is not reached with the city by Dec. 1, 1917.

Trains of Steel and Wood Cars Opposed.—The danger of using wood trail cars between steel motor cars was emphasized recently in a report made by Clifton W. Wilder, electrical engineer of the Public Service Commission for the First District of New York, at a hearing held by the commission in regard to the joint operation on the Rockaway Beach line via Chestnut Street junction by the Long Island Railroad and the New York Consolidated Railroad. The question before the commission is whether or not the proposed equipment to be used on the line "will be unsafe, improper or inadequate." The Long Island Railroad stated to the commission that the maximum service on Sunday would require it to furnish as its proportion of the equipment twenty trail and forty motor cars. The company has no wood motor cars and steel trail cars available. Mr. Wilder's opinion is that the operation of mixed wood and steel cars is extremely dangerous and offers a serious fire hazard.

Suit brought in Seattle Case.—The city of Seattle, Wash., has brought suit in the King County Superior Court against the Puget Sound Traction, Light & Power Company to recover $64,387, representing 2 per cent of the gross earnings of the street railway system during 1916. This matter, as well as the paving of rights-of-way, has been before the courts for approximately two years, ever since the company appealed to the Public Service Commission to be relieved of certain of its franchise obligations. The Public Service Commission has not yet acted upon the petition, and since then the company has paid the gross earnings tax under protest, and has planked rights-of-way instead of paving them. On Jan. 15 last the company tendered the city of Seattle a check for $64,387, to be considered as paid under protest, with the further stipulation that the check was to be returned unless the city abandoned its plan to bring suit against the company to enforce that provision in the street railway franchises requiring the company to pave rights-of-way with the same material and at the same time as the remainder of the street is paved. The Council directed that the check be returned, and the suit to enforce the paving obligation was brought before the Superior Court.

Programs of Association Meetings

Arkansas Association of Public Utility Operators

The tenth annual convention of the Arkansas Association of Public Utility Operators will be held in Pine Bluff, Ark., on May 16, 17 and 18. The program of papers is now being completed.

American Railway Association

In view of the present national crisis and the earnest desire of the railroads to render the greatest service and to co-operate heartily with the government in the conduct of the war, the executive committee of the American Railway Association has postponed indefinitely the spring session of the association, which was to have been held on May 16.

Pennsylvania Street Railway Association

The executive committee of the Pennsylvania Street Railway Association has resolved that because of the war there will be only a one-day meeting of the association at this time. It will be held on May 11 at the Harrisburg Club, Harrisburg, beginning at 11 o'clock. Luncheon will be served at 2 o'clock and instead of a set program, after routine business of the association, the following "war time policies" will be discussed in an informal way:

1. In what specific ways can the street railway interests of Pennsylvania best serve the State and the nation? (a) as companies, (b) as individuals?

2. What policies have been adopted relative to (a) protection of power plants, bridges and other property? (b) registering of employees as to nationality and loyalty? (c) contributions to dependents of employees called to active service? (d) transportation of troops and filing of tariffs in connection with same? (e) transportation of individual soldiers and sailors in uniform? (f) possibilities of employing women in train service? (g) carrying posters in and on cars to encourage enlistment?

The subject "War Time Economies" will also be discussed. The object will be to secure suggestions as to practical methods of meeting present material and labor conditions, such as substitution of materials, operating economies, etc.

Financial and Corporate

Annual Report

Cleveland Railway

The income statement of the Cleveland (Ohio) Railway for the year ended Dec. 31, 1916, follows:

I.—BASED ON ORDINANCE ALLOWANCES

		Cents per Car-Mile
Operating revenues:		
Revenue from transportation	$9,428,091	....
Revenue from other operations	93,464	....
Total operating revenues	$9,521,555	28.11
Expense allowances:		
Maintenance	$1,673,548	4.94
Operating	4,492,732	13.27
Total expense allowances	$6,166,280	18.21
Net operating revenue	$3,355,275	9.90
Non-operating income	75,750	0.22
Gross income	$3,431,025	10.12
Taxes	579,423	1.71
Net income	$2,851,602	8.41
Interest	1,912,815	5.65
Surplus	$938,787	2.76
Special allowances	936,000	2.76
Net surplus	$2,787	....

II.—BASED ON ACTUAL EXPENSES

		Cents per Car-Mile
Operating revenues	$9,521,555	28.11
Actual expenses:		
Maintenance of way and structures	$1,062,379	3.14
Maintenance of equipment except power plant	808,060	2.38
Maintenance of power plant	49,254	0.15
Total maintenance	$1,919,693	5.67
Power	$811,594	2.40
Conducting transportation	2,824,852	8.34
Traffic	500	....
General and miscellaneous	1,103,793	3.26
Total operating	$4,740,739	14.00
Total expenses	$6,660,433	19.67
Net operating revenue	$2,861,122	8.44
Non-operating income	75,751	0.22
Gross income	$2,936,873	8.66
Taxes	579,423	1.71
Net income	$2,357,450	6.95
Interest	1,912,815	5.65
Surplus	$444,635	1.30
Obsolete property	384,000	1.13
Net surplus	$60,635	0.17

The increase in gross receipts in 1916 over 1915 amounted to $1,054,993 or 12.35 per cent. This gain was made up as follows: Revenue from transportation, 12.42 per cent; revenue from other operations, 14.43 per cent, and non-operating income, 2.60 per cent. The passenger revenue increased 12.53 per cent to $9,289,899; the chartered-car revenue, 6.92 per cent to $10,119; the express revenue, 24.01 per cent to $43,357, and the milk revenue, 15.23 per cent to $17,772. Other transportation revenues showed decreases.

The increase in receipts per car-mile during 1916 was 7½ per cent. This increase was not due to an increase in rate of fare or in rate of speed, but to the fact that the percentage of increase in the number of passengers was greater than in the number of car-miles. The increase in service, measured in car-miles, was but 4½ per cent. The increase in the number of rides was more than 12½ per cent.

The rate of fare in effect in both years was rate "e" of the Tayler franchise, "3 cents cash fare, 1 cent transfer, no rebate." The 5-cent fares to some of the suburbs — Lakewood, Cleveland Heights and others — brought the average fare per passenger to 3.417 cents. The ratio of transfers to fares in 1914 was 40 per cent, in 1915 it was 37½ per cent, and in 1916 it was 37.12 per cent. The maximum fare permitted by the Tayler franchise is "4 cents cash fare, seven tickets for 25 cents, 1 cent transfer, no rebate." If this maximum rate should come into effect, and if the ratio of transfers to fares should then be the same as it was in 1916, the average fare would be about 4 cents. The difference, therefore, between the maximum rate and the present rate is 0.583 cent, which is 17 per cent more than the present rate.

In discussing service, the annual report states that the present schedules on nearly all the lines require the operation during the evening rush hours of many more cars than twice the number operated per hour on the base table, and, under a franchise provision, the company is entitled to, and expects to ask, an additional allowance for operating expenses. The allowance, however, if made by the Council or awarded by arbitration, will not affect the actual cost of operation or increase the company's earnings either in gross or per car-mile. An increase in the allowance, however, it is said, will probably necessitate an increase in the rate of fare.

The franchise thus furnishes reasons that should appeal to the city to co-operate with the company to bring about more economical operation by inducing passengers to vary their times of travel.

The expenditures in 1916 for injuries and damages amounted to $570,856, an increase of $195,151 over the expenditures of 1915. The price of injuries has increased at equal pace with the prices of labor and commodities. It is estimated that it will cost about $400,000 to adjust and settle all pending suits and claims for damages. The taxes of 1916 were 18.72 per cent higher than those of 1915. The increase was due largely to the fact that the State Tax Commission fixed a higher valuation by $2,749,920 than was fixed for 1915. The tax rate in 1915 was $1.53, and in 1916 it was $1.55. The betterment expenditures in 1916 totaled $858,434.

On Dec. 31, 1916, there was a balance of $545,438 in the interest fund, or $45,438 more than the amount placed in the fund originally under the provisions of the Tayler ordinance. This is accounted for as follows: Profits (earnings in excess of allowances, taxes and interest) in 1910, 1912, 1915 and 1916, $463,173; losses (allowances, taxes and interest in excess of earnings) in 1911, 1913 and 1914, $417,735; net increase in fund, $45,438.

The general relation between results in the last two years is shown by the following percentages of increase for 1916:

	Per Cent		Per Cent
Passenger revenue (exclusive of transfers)	12.60	Total expenses, taxes and interest	12.62
Passenger revenue (including transfers)	12.53	Fares	13.12
Gross income	12.35	Transfers	11.90
Maintenance allowance	4.29	Rides	12.57
Maintenance expenses	12.41	Ordinance car-miles	4.45
Operating allowance	11.34	Actual car-miles	4.50
Operating expenses	16.34	Allowances, taxes and interest	16.04
Taxes	18.72	Expenses, obsolete equipment, taxes and interest	14.40
Interest	3.03		
Operating expenses, taxes and interest	12.67		

Electric Railway Earnings

Two Hundred and Ninety-four Companies Gain 9.65 Per Cent in Gross and 9.18 Per Cent in Net During 1916

The annual compilation of the gross and the net earnings of electric railways in the United States made by *The Commercial & Financial Chronicle* shows, it is said, that the influence of jitney competition as a disturbing factor has in a large measure passed away. For the calendar year 1916 the electric carriers again displayed their former characteristics and registered "the normal rate of progress which seems to be the law of their existence."

The gross earnings for 294 electric railways in 1916 were $582,697,750, an increase over 1915 of $51,272,132 or 9.65 per cent. The net earnings for the same roads in 1916 were $219,236,230, an increase of $18,444,332 or 9.18 per cent. The activity in trade and business had some influence in bringing about this improvement, but not such a tremendously important influence as in the case of the steam railroads.

Without doubt, it is said, the effect of business activity in 1916 would have been more marked in the case of the electric lines if it had not been for severe strikes in New York City. These served to reduce heavily the earnings of the metropolitan traction lines. Local traction troubles at one or two other points had a similar effect in reducing revenues, both gross and net.

Not all of the separate roads included in the compilation shared in the improvement. Altogether, out of the 294 roads, forty-three showed a decrease in gross earnings and eighty a decrease in net earnings. The compilation is made up in considerable part of street railways, but the table includes many other electric lines in suburbs and also numerous interurban electric railways of large magnitude.

Besides the companies that furnished returns of both gross and net earnings, nine other lines gave figures of gross alone. For the total of 303 lines the gross earnings amounted to $584,864,779 in 1916, an increase of $51,280,442 or 9.61 per cent. By applying to these nine roads the same operating ratios for 1916 and 1915 as were found in the case of the large number of companies furnishing full reports, it was calculated that the aggregate net for the whole 303 roads reached $220,587,618 in 1916, an increase of $18,452,949 or 9.13 per cent.

By adding the returns of fifty-seven companies which reported for the fiscal year ended June 30, 1916, it was possible to get a general aggregate for 360 electric railways. The total of the gross earnings for the last year was $626,840,449, an increase of $52,457,550 or 9.13 per cent. The aggregate net earnings were $234,402,450, an increase of $18,484,877 or 8.56 per cent.

The minor railways not represented in the compilation, it is stated, would not swell the total to any great extent, but a few large companies are missing. Among these may be mentioned the Denver Tramway System, the Toledo Railways & Light Company and the Wilkes-Barre Railway. Many of the railways furnish electricity for lighting and power purposes, but in a number of cases only the income derived from the street railway departments of the company was included in the table.

The comparative totals of gross and net since 1905 are shown in the following table:

GROSS EARNINGS

Period	Current Year	Previous Year	Increase	Per Cent
1905 compared with 1904..	$306,067,145	$281,608,936	$24,458,209	8.68
1906 compared with 1905..	300,567,453	269,595,551	30,971,902	11.49
1907 compared with 1906..	306,266,315	280,139,044	26,127,271	9.33
1908 compared with 1907..	351,402,164	348,137,240	3,264,924	0.94
1909 compared with 1908..	374,305,027	345,006,370	29,298,657	7.49
1910 compared with 1909..	435,461,232	405,010,045	30,451,187	7.51
1911 compared with 1910..	455,746,306	428,631,259	27,115,047	6.33
1912 compared with 1911..	486,225,094	457,146,070	29,079,024	6.36
1913 compared with 1912..	529,997,522	500,252,430	29,745,092	5.94
1914 compared with 1913..	553,095,464	548,296,520	4,798,944	0.87
1915 compared with 1914..	567,901,652	569,471,260	*1,569,608	*0.28
1916 compared with 1915..	626,840,449	574,382,899	52,457,550	9.13

NET EARNINGS

Period	Current Year	Previous Year	Increase	Per Cent
1905 compared with 1904..	$130,884,923	$118,221,741	$12,663,182	10.71
1906 compared with 1905..	126,580,195	114,024,076	12,556,119	11.01
1907 compared with 1906..	126,002,304	121,050,703	4,951,601	4.09
1908 compared with 1907..	142,262,417	141,144,213	1,118,204	0.79
1909 compared with 1908..	160,394,765	140,647,906	19,746,859	14.03
1910 compared with 1909..	178,037,379	167,100,351	10,937,028	6.54
1911 compared with 1910..	186,001,439	175,527,542	10,473,897	5.96
1912 compared with 1911..	194,309,873	179,915,760	14,394,113	8.00
1913 compared with 1912..	204,422,429	193,393,045	11,029,384	5.70
1914 compared with 1913..	211,020,088	212,146,403	*1,126,315	*0.53
1915 compared with 1914..	214,319,303	217,440,533	*3,121,230	*1.43
1916 compared with 1915..	234,402,450	215,917,573	18,484,877	8.56

*Decrease.

Connecticut Recognizes Utility Bonds

The Governor of Connecticut has signed the amendment to the banking law of that State that has just been passed by the Legislature widening the scope of investments which are legal for savings banks to purchase. The investments so sanctioned include bonds of certain gas, electric, water and telephone companies of the New England States and New York to the amount of 2 per cent of the deposits and surplus of the banks. As noted in the ELECTRIC RAILWAY JOURNAL of April 14, page 708, the State of Maine recently passed a bill amending the savings bank law there so as to include certain bonds of public utility corporations not heretofore recognized as legal for investment in that State.

Shore Line Program Approved

Amendments to the Charter Desired by the Company Are Passed

The amendment to the charter of the Shore Line Electric Railway, Norwich, Conn., has passed both houses of the General Assembly of Connecticut in somewhat different form than originally presented, but the company has accomplished all that it desired to accomplish. It has secured the right to sell power to all public utility corporations doing business in its territory and to increase its capitalization as required, and has also obtained confirmation of the consolidation of its various properties. In addition to this program the company asked the Assembly to dissolve by legislative enactment the three companies that it absorbed on Nov. 1. This was denied as a legislative measure, but will be accomplished through dissolution in the ordinary way, by vote of the stockholders and public notices in the papers. Legislative dissolution would have relieved the company of these details.

A charter has also been secured for the Shore Line Electric Railway in Rhode Island, with the same stockholders as in Connecticut, absorbing, in this way, all the rights possessed by the Pawcatuck Valley Street Railway, Ashaway & Westerly Railway and the Westerly & Connecticut Railway. These were all owned until recently by the Norwich & Westerly Traction Company. This form of duplicate incorporation in two States is somewhat unusual. The New York, New Haven & Hartford Railroad was the first to secure this right. The Norwich & Westerly Traction Company then secured a similar charter and now the Shore Line Electric Railway is permitted the same privilege and absorbs the rights of the Norwich & Westerly Traction Company.

The program of the company for the accomplishment of the purposes mentioned was referred to briefly in the ELECTRIC RAILWAY JOURNAL of Feb. 10, page 268.

Additional Financing Proposed

American Water Works & Electric Company Proposes to Wipe Out Accumulated Dividends and Provide for Future

A circular has been issued to holders of voting trust certificates of the American Water Works & Electric Company, Inc., New York, N. Y., outlining a plan calling for an increase in the company's preferred stock from $5,000,000 to $10,000,000. Of such increase $450,000 is to be issued at once to meet a part of the 21 per cent, or $1,050,000, of dividends now in arrears on the issue. The remainder of the authorized increase of $4,550,000 is to be issued from time to time to provide for improvement, betterments, etc., and to supply capital for enlarging activities of the company and for corporate purposes. If the plan is consummated, the directors believe that the company may safely begin paying in cash the current dividend on the first preferred stock. The plan provides that the dividend shall be liquidated as follows: $150,000 or 3 per cent, in cash forthwith; $450,000 or 9 per cent, in first preferred stock at par, and $450,000 or 9 per cent, in common stock at 22½, or $2,000,000 par value of common stock. On this basis the holder of $10,000 of first preferred stock, upon which there is due $2,100 accumulated dividends, will receive $300 in cash, $900 par value first preferred stock at par and $4,000 par value common stock at $22, or $900, making a total of $2,100.

Among the companies which the American Water Works & Electric Company controls are the West Penn Railways, the West Penn Traction Company and the West Penn Traction & Water Power Company.

Bay State Street Railway, Boston, Mass.—The Massachusetts Public Service Commission has authorized the Bay State Street Railway to issue $489,000 of first preferred stock at $100 a share, $325,000 of Boston & Northern Street Railway fifty-year 4 per cent bonds and $398,000 of Old Colony Street Railway bonds, the proceeds to be used to pay floating debt and for construction and equipment.

Boston (Mass.) Elevated Railway.—The directors of the Boston Elevated Railway have declared a quarterly dividend of 50 cents a share, payable on May 15 to stock of record of May 2. This makes $5 per share declared for the fiscal year ending June 30.

Boston & Worcester Street Railway, Boston, Mass.—The Boston & Worcester Street Railway has applied to the Massachusetts Public Service Commission for authority to issue $270,000 of additional preferred stock and $40,000 of additional first mortgage bonds, which will make $667,000 of stock and $2,440,000 of bonds outstanding respectively.

Brazilian Traction, Light & Power Company, Toronto, Ont.—Alexander Mackenzie, president of the Brazilian Traction, Light & Power Company, has issued a statement in regard to the proposed suspension of dividends on the ordinary stock. In concluding this statement Mr. Mackenzie said: "Owing to the abnormal conditions arising from the war it has been necessary to meet capital requirements, so far as has not been paid out of earnings, by temporary loans, with the result that the floating debt of the company and its subsidiaries on March 31 amounted to $4,850,000. Dividends on the preferred shares call for $600,000 yearly, and on the ordinary shares at 4 per cent per annum call for $4,250,000, making a total of $4,850,000, which sum deducted from the estimated net revenue, leaves only a relatively small balance available for capital expenditure and floating debt. The board has, therefore, decided not to pay a dividend in June next and proposes to continue this policy throughout the year, unless there should be such improvement in foreign exchange to justify the resumption of the dividend at an earlier date."

Caldwell (Idaho) Traction Company.—Walter R. Sebree, president of the Caldwell Traction Company, reports that his company is planning to issue $100,000 of bonds to provide funds to electrify its Wilder branch, now operated by steam, and to extend the present lines. The bonds are to run for ten years at 6 per cent interest. The trustee of the issue will be the Tracy Loan & Trust Company, Salt Lake City, Utah. All the stock of the Caldwell Traction Company is in the hands of the Sebree family. The property is at present free from bonded indebtedness.

Cleveland (Ohio) Railway.—The statement of operation of the Cleveland (Ohio) Railway for March shows an increase in the interest fund from $434,744 to $445,959. After making several payments, in accordance with agreements and findings, the accumulated deficit was $1,063,098, not including any allowance for the old Cedar Avenue power house. The ordinance allowance for maintenance was $118,029, and for operation, $427,856, a total of $545,886, while the actual expenditures were $545,143, leaving a balance of $742. For the month the total number of rides was 33,779,647, an increase of 10.01 per cent over last year. The number of fares was 24,747,216, an increase of 10.04 per cent. Transfers increased 6.04 per cent over the same month in 1916.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—The sale of the Columbus, Delaware & Marion Railway has been ordered by Judge Kinkead in the Common Pleas Court following an agreement between counsel for the sale to be subject to mortgages held by the Guaranty Trust Company, New York, and the Cleveland Trust Company, Cleveland, Ohio. The receiver of the company had paid all interest charges up to last November. The demand for improvements in 1916, however, caused the expenditure of all surplus earnings, and no money was available to meet the interest due in November on the first mortgage. Later the receiver was ordered by the court not to pay interest on the second mortgage bonds of the company due on Feb. 1.

Empire United Railways, Inc., Syracuse, N. Y.—Interest on the Syracuse, Lake Shore & Northern Railroad and the Auburn & Northern Electric Railroad bonds will be paid on May 1 under a ruling by Supreme Court Justice Hubbs, directing receivers H. S. Holden and C. L. Allen to make the payment of about $68,500. At the same time the court directed the receivers under the Syracuse, Lake Shore & Northern Railroad foreclosure action, which was abandoned when the Ford, Bacon & Davis reorganization plan was adopted, to turn over to themselves as receivers $76,726, which had accumulated under the Lake Shore receivership. The May 1 interest will be paid from the proceeds of this fund.

Grand River Valley Railway, Grand Junction, Col.—A. E. Carlton, vice-president of the Grand River Valley Railway, Grand Junction, Col., which also does lighting in Grand Junction and Fruita, in conjunction with his associates purchased the property of the Colorado Midland Railroad, a steam line, under foreclosure at public auction on April 21. According to the Denver *News* the new owners propose to make the Grand River Valley Railway, which is operated by electricity, a part of the Colorado Midland system.

Long Island Railroad, New York, N. Y.—The plans of the Long Island and the Pennsylvania Railroads for the readjustment of their financial relations to relieve the Long Island of some $700,000 a year interest charges, and to give the Pennsylvania ownership of all of the Long Island stock has received tentative approval from the Public Service Commission for the Second District of New York. Under the proposal which now awaits only the formal approval of the commission, the Long Island Railroad will issue about $22,000,000 of common stock and $5,202,100 of 5 per cent debenture bonds. The stock will be acquired by the Pennsylvania Railroad and used to cancel a like amount of Long Island bonds held by the Pennsylvania Railroad upon which the Long Island now pays 4 per cent a year. The minority stockholders of the Long Island Railroad will receive the 5 per cent debentures in exchange at par for their holdings which will pass to the Pennsylvania Railroad.

Northern States Power Company, Chicago, Ill.—An offering of $1,500,000 of new 7 per cent preferred stock, at par and accrued dividends, is being made to the shareholders of Northern States Power Company, nearly 3000 of whom reside in the territory served by the company in Minnesota and adjoining states. Any part of the issue which may not be taken by stockholders will be purchased by a syndicate composed of H. M. Byllesby & Company, William P. Bonbright & Company and Spencer Trask & Company. Proceeds of the stock will be used to acquire additional distribution centers, enlarge property and extend transmission lines.

Orleans-Kenner Electric Railway, New Orleans, La.—It is understood now that before the negotiations are concluded looking toward the control of the Orleans-Kenner Electric Railway passing to the New Orleans Railway & Light Company the residents of Jefferson Parish will have an opportunity to liquidate the indebtedness of the company to Bertron, Griscom & Company. This decision was reached at a meeting at which Harry K. Johnson, promoter of the Orleans-Kenner Electric Railway, explained the matter to the residents of the territory served by the company. Mr. Johnson reiterated very largely the statement made by Francis T. Homer, of Bertron, Griscom & Company, referred to in the ELECTRIC RAILWAY JOURNAL for April 28, page 799. Mr. Johnson said: "This road owes Bertron, Griscom & Company, who own the controlling interest in the New Orleans Railway & Light Company, about $170,000. To secure this loan, we have pledged to them 51 per cent of our capital stock and a majority of our bonds. We have got to repay the loan, and we have been unable to finance the road, except through delivery of the control to Bertron, Griscom & Company."

United National Utilities Company, Philadelphia, Pa.—The Utilities Service Corporation, Philadelphia, Pa., is offering for subscription at $100 per share with 50 per cent of common stock as a bonus the unsold balance of $2,500,000 of 6 per cent cumulative preferred stock of the United National Utilities Company. The United National Utilities Company among other properties controls the American Railways and the Jersey Central Traction Company and affiliated lighting companies.

West Penn Railways, Pittsburgh, Pa.—The shareholders of the West Penn Railways and the West Penn Traction Company will vote on May 15 on a merger plan, the new company to be known as the West Penn Railways, with an authorized capital stock of $20,000,000, of which $10,000,000 will be common stock and $10,000,000 6 per cent cumulative preferred stock, preferred both as to dividends and assets and redeemable at 105. Of the stock so authorized $7,365,406 of the preferred and $8,044,700 of common will be issued, and the remainder reserved for future purposes.

West Virginia Traction & Electric Company, Wheeling, W. Va.—William P. Bonbright & Company, Inc., New York, N. Y., have underwritten $1,800,000 of 6 per cent secured notes of a new authorized issue of $2,000,000 of the West Virginia Traction & Electric Company. The proceeds will be used to retire the two-year 6 per cent collateral gold notes of the company, due on June 1, 1917. It is expected that a public offering of the notes will be made in the near future.

Dividends Declared

American Railways, Philadelphia, Pa., quarterly, 1¾ per cent, preferred.

Bangor Railway & Electric Company, Bangor, Me., quarterly, one-half of 1 per cent, common.

Bristol & Plainville Tramway, Bristol, Conn., quarterly, 2 per cent.

Connecticut Railway & Lighting Company, Bridgeport, Conn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.

East St. Louis & Suburban Company, East St. Louis, Ill., quarterly, three-quarters of 1 per cent, preferred.

Illinois Traction Company, Champaign, Ill., quarterly, three-quarters of 1 per cent, common.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
ATLANTIC SHORE RAILWAY, SANFORD, ME.						
1m., Mar.,	'17	$25,739	*$23,449	$2,290	......	......
1 " "	'16	23,473	*22,283	1,190	......	......
CITIES SERVICE COMPANY, NEW YORK, N. Y.						
1m., Mar.,	17	$1,721,480	$31,312	$1,690,168	$225	$1,689,943
1 " "	'16	639,780	19,079	620,701	44,716	575,985
12 " "	'17	13,391,411	268,593	13,122,818	127,917	12,994,901
12 " "	'16	5,295,093	190,217	5,104,876	499,368	4,605,508
FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.						
1m., Mar.,	'17	$239,235	*$156,831	$82,404	$49,925	$32,479
1 " "	'16	216,914	*144,538	72,376	49,280	23,096
3 " "	'17	712,926	*455,341	257,585	148,861	108,724
3 " "	'16	658,614	*439,756	218,858	146,672	72,186
HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.						
1m., Mar.,	'17	$544,365	*$244,614	$299,751	$218,865	$80,886
1 " "	'16	510,203	*225,376	284,827	213,161	71,666
3 " "	'17	1,583,460	*710,273	873,187	651,299	221,888
3 " "	'16	1,478,022	*647,526	830,496	639,865	190,631
KANSAS CITY (MO.) RAILWAYS						
1m., Feb.,	'17	$564,260	*$380,509	$183,751	$131,159	††$39,805
1 " "	'16	545,435	*361,513	183,922	115,333	††43,078
8 " "	'17	4,917,264	*3,286,364	1,631,278	1,041,340	††309,515
8 " "	'16 **					
LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.						
1m., Mar.,	'17	$218,467	*$147,615	$70,852	$51,429	‡$31,128
1 " "	'16	192,104	*119,661	72,441	51,923	‡31,105
12 " "	'17	2,584,929	*1,655,329	929,600	626,387	‡452,457
12 " "	'16	2,205,377	*1,300,807	904,570	650,159	‡393,273
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO						
1m., Mar.,	'17	$524,703	$324,501	$200,202	$78,751	$121,451
1 " "	'16	392,206	189,547	202,659	106,375	96,284
3 " "	'17	1,492,088	904,552	587,536	245,439	342,097
3 " "	'16	1,118,751	533,974	584,777	293,550	291,227
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.						
1m., Feb.,	'17	$158,578	*$96,565	$62,013	$29,114	$32,899
1 " "	'16	141,880	*88,509	53,371	28,725	24,646
12 " "	'17	1,967,490	*1,175,735	791,755	347,465	444,290
12 " "	'16	1,739,749	*1,070,285	669,464	334,159	335,305
REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO						
1m., Mar.,	'17	$376,822	*$245,765	$131,057	$78,347	‡$53,842
1 " "	'16	330,046	*198,688	131,358	65,995	‡67,385
12 " "	'17	4,143,045	*2,514,630	1,628,415	868,735	‡778,566
12 " "	'16	3,355,280	*1,982,024	1,373,256	717,657	‡662,127
TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.						
1m., Mar.,	'17	$916,605	$610,439	$306,166	$150,094	$156,072
1 " "	'16	850,282	542,924	307,358	145,586	161,772
3 " "	'17	2,641,912	1,799,459	842,453	435,069	407,384
3 " "	'16	2,490,985	1,609,174	881,811	427,882	453,929

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*Includes taxes. ††Includes addition of miscellaneous income and deduction of Kansas City surplus reinvested in plant. **During the fiscal year to Feb. 14, 1916, the property was operated by the receivers under the old securities, and the figures for this period, being without value in a comparative statement, are not shown here. ‡Includes non-operating income.

Traffic and Transportation

Employees War on Jitneys

Committee of Los Angeles Railway Employees' Co-operative Association Successfully Circulates Anti-Jitney Initiative Ordinance

Owing to the ineffectiveness of the present jitney ordinance, the Los Angeles (Cal.) Railway has prepared an initiative ordinance to be submitted to the voters of Los Angeles on June 5. The salient features of the proposed ordinance, in addition to the present license, the Board of Public Utilities control and $10,000 bond requirements, are that "each bus must be operated from 6 a. m. to 12 o'clock midnight" and that "no bus shall be operated in the congested district of the city."

This ordinance, an abstract of its main features and a statement of the attitude of the Los Angeles Railway employees, are being circulated for signatures on the initiative petition by a committee of 100 from the Co-operative Association of the Los Angeles Railway employees, assisted by all the wives of the members. These delegates on April 21 began a house-to-house canvass of the entire city. Although only 4800 bona-fide signatures of voters are required on an initiative petition, more than 10,000 signatures were obtained on the Saturday half-holiday, April 21, and on Monday, April 23. The delegates have met with the most encouraging reception everywhere. The abstract of the petition as circulated by the committee of employees read, in part, as follows:

THE MEN STATE THEIR POSITION

"Our whole body of men are feeling keenly the high cost of living, in common with the other wage earners of the country. We are, however, in the unfortunate position of having made application to our company for an increase of wages, but find it also is hard pressed to make both ends meet, owing to the unrestricted and unfair jitney competition.

"Our company pays annually to the State and to the city in the form of direct taxation and for paving and assessments practically $20 per seat of the maximum number of cars operated in the evening rush hour, while the jitneys pay about $3.50 per seat per annum, operate parallel to our lines, making the short runs and taking the straight 5-cent fares, absorbing the cream of the business and leaving the unprofitable portion for the company. Our hope is to restore the revenues of the company and thereby enable our employer to increase wages."

This initiative petition is the outgrowth of an employees' mass meeting called by the management to explain the financial status of the company. The men were so indignant at the unfair jitney competition that they wanted to make a direct appeal to the City Council; but after conference with the management the present plan of going to the voters with an initiative ordinance was adopted as more effective.

I. C. C. to Consider Freight Advance

The Interstate Commerce Commission has outlined its procedure in the hearing on the proposed 15 per cent increase in freight rates. The subject will be considered under seven heads, as follows:

The present emergency; war conditions; labor and wages; cost of fuel, material and supplies; recent changes in rates; the reasonableness of the proposed increased rates; and application to be made of the proposed increased revenue. Under the first head the commission will ask if an emergency affects all carriers alike, whether all require the same degree of relief, why that relief should take the form of a general percentage increase, and why the increase should be 15 per cent. The extent to which the Adamson law is responsible for the alleged emergency also is to be brought out.

Progress in Buffalo Survey

Construction of a Rapid Transit System and a Loading Terminal Are Recommended, Besides Several Rerouting Plans

The Chamber of Commerce of Buffalo, N. Y., is taking an unusual interest in the efforts of the two special traffic committees and the street railway officials to improve the local traffic conditions through the extensive survey now being made in that city. The International Railway has several rerouting plans under consideration. As soon as the Franklin Street franchise is approved by the Public Service Commission, tracks will be laid and many lines now using Main Street between The Terrace and Allen Street will use the Franklin Street line. Another plan calls for the removal from Washington Street of the cars of the heavily-patronized Broadway line, one of the largest traction arteries, to the east side. The special traffic committee of the Chamber of Commerce, which was appointed several months ago, has recommended the construction of a subway or an elevated system. M. S. Burns, chairman of the committee, did not indicate in his report which would be the better, but municipal authorities seem to favor the former.

Charles R. Barnes, electric railway inspector of the Public Service Commission for the Second District, who has been in Buffalo for two months investigating traffic conditions, will complete his report about June 1. R. G. Winans, assistant electric railway inspector, is aiding in the work, and several men in the employ of the railway are helping to make the traffic studies. Mr. Barnes is now investigating the present shortage of power.

Capt. George H. Norton, city engineer of Buffalo, has recommended the construction of a loading terminal on the site acquired by the company several years ago. At that time the company proposed to construct a large interurban terminal and office building on Pearl Street, in the heart of the downtown business section. Captain Norton has suggested that a loading terminal with separate tracks for the North Main Street, Riverside and West Side lines would facilitate the movement of traffic during the rush hours. He also favors the construction of a subway through the congested district.

Copper-Fare Zones Authorized

Small Massachusetts Road Will Charge 2 Cents per Mile, with a Minimum Rate of 6 Cents

The Public Service Commission of Massachusetts has granted to the Concord, Maynard & Hudson Street Railway, Maynard, Mass., a subsidiary of the Massachusetts Consolidated Railways, authority to establish a copper-zone system of fares on a 6-cent basis. The hearing was held on April 18. The case was the first the Massachusetts Commission has had which involved a copper-fare zone system proposed by a street railway. The company will charge 2 cents per mile for the distance actually traveled with a minimum charge of 6 cents. The road will be divided into 1-mile zones, indicated by mile posts, and a passenger may ride any distance within three consecutive zones for 6 cents with a charge of 2 cents for each additional mile or fraction thereof. The company proposed the new system in order to meet increasing operating expenses, chief of which is for coal, which now costs $10.50 per ton as compared with $3.50 per ton in 1914. Quotations for future deliveries promise no relief.

The company's line is 18 miles long and runs from Concord Center through Acton, Maynard and Stow to Hudson Center, with a 4-mile branch from Maynard Center to West Acton. The average capitalization per mile is $26,102 compared with $52,111 for all Massachusetts street railways except the Boston Elevated. The dividend rate has averaged 1 per cent in the sixteen years the company has been operating. The net earnings in 1916 were $27,568, a decrease in that year of 9 per cent as compared with those of 1912. Taxes increased 34.9 per cent since 1912, the operating expenses 19.41 per cent, while the net divisible income decreased 27.41 per cent. R. H. Holt, counsel for the company, stated that the cost of power per car-mile was 5.57

cents in 1916 while the average for Massachusetts companies was 3.13 cents. The present fare on the main line is 6 cents with zones from 3 to 4 miles in length and a 5-cent fare is charged on the West Acton branch.

The company anticipates no difficulties in fare collection on closed cars and expects to apply the new system to open-car service by cutting an aisle through the open cars. The estimated cost of remodeling the cars is about $250 each. It is proposed to accept transfers from connecting roads at each end for a ride within a 1-mile zone.

Chicago to Enforce Traffic Rules

The two ordinances relative to "loading zones" and vehicle parking, in Chicago, Ill., became effective on May 1. They were passed by the City Council on March 12, as reported in the issue of the ELECTRIC RAILWAY JOURNAL of March 17, page 521. In order to accelerate these campaigns the city authorities, prior to May 1 sent to all garage owners, teaming concerns, etc., notices to remind drivers of the new law. The so-called "loading zones" in the downtown districts have been marked off with 7-ft. standards placed on the sidewalk near the curb. The notice sent out to owners and drivers of vehicles was in the form of a 21-in. x 28-in. poster and read as follows:

"'Loading zones,' or spaces, to allow passengers to board street cars are established on various downtown streets by city ordinance, effective on May 1, 1917. These 'loading zones' will be designated by appropriate signs, placed on sidewalks near the curb. Vehicles shall not be permitted to stop within 'loading zones' except upon the signal of a police officer, provided, however, that one vehicle at a time shall be permitted to stop within certain zones for the purpose of loading, or unloading merchandise received from or delivered to, occupants of buildings fronting on certain zones. Vehicles shall pass through loading zones in conformity with the traffic officer's signal and in single file, and shall keep as close as possible to the right-hand curb.

"After May 1, 1917, between the hours of 7 and 10 a. m. and between 4 and 7 p. m., no vehicle shall be permitted to stand on any public street on which street cars are operated within the district bounded on the north by the north line of Lake Street, on the east side by the east line of Wabash Avenue, on the south by the south line of Van Buren Street and on the west by the west line of Market Street, for a longer period than necessary for such vehicle to load or unload its occupants, baggage or merchandise.

"Violators of either of the foregoing ordinances may be punished by a fine not to exceed $100 for each offense."

Dallas Jitney Ordinance Opposed

A temporary injunction against enforcement of the initiative ordinances, including a jitney ordinance, recently adopted in Dallas, Tex., subject to approval in the city election, has been granted by Judge Foree of the District Court of Dallas County. The initiative jitney ordinance was approved by the voters, and was to have become effective after a few days. It required owners of jitney buses in Dallas to make up an indemnity fund of $5,000, or more, to protect the public against injury or property damage. Prospective jitney operators had complied with its provisions, 103 jitney owners having subscribed $50 each to this fund, and it was believed that 100 more would place cars in service after the ordinance went into effect.

The injunction was granted on petition of the Dallas Consolidated Electric Street Railway, the Rapid Transit Railway, and the Metropolitan Electric Street Railway, all of Dallas. It stated that the ordinance was invalid because it had not been printed and sent out to the voters in conformity with the law prior to the election. It was also alleged that it destroys the safeguards of the rights of the people as contained in the previous ordinance of Jan. 5, and that it operates to reduce the possible revenues of the city through licenses. Operation of motor buses under the ordinance would deprive the plaintiffs of gross revenue of about $1,200 a day, it is stated, and would interfere with street car schedules. It is further claimed that the motor bus operators are irresponsible.

One-Man Cars for Fargo, N. D.—The Northern States Power Company is contemplating the substitution of fifteen one-man cars for twelve cars now in service on its street railway system in Fargo, N. D.

Jitney Operator Loses Amount of Bond.—The sum of $2,500, the full amount of the bonds of August Olson of Seattle, Wash., driver of a jitney bus, was awarded by a jury recently to Mrs. Henry Price, in the King County Superior Court. Mrs. Price was run down by a jitney operated by Olson on Sept. 31, 1915. Suit was brought against Olson and John C. Lynch, as ancillary receiver of the Pacific Coast Casualty Company.

Conductor Directs His Passengers.—A safety-first suggestion made by H. K. Stith, a conductor on the Louisville (Ky.) Railway, follows: "I think many accidents would be prevented if conductors would ask passengers who have boarded a car just before it rounds a curve not to walk in to take seats until the car has made the curve. Many times they are thrown against seats or doors and are often hurt. I find it to be a great help on single-truck cars."

Children Rewarded for Safety Suggestions.—As a result of the safety-first contest in the campaign which the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., has been conducting for several months, unusual interest has been manifested by the school children in the company's territory. The company offered five prizes of $2 each for the five best suggestions on the prevention of accidents, and received a large number of excellent replies.

Universal Transfer Plan for Cincinnati.—The Council Committee on street railways has been informed by the Cincinnati (Ohio) Traction Company that a plan for universal transfers is being prepared under the terms of the rapid-transit ordinance, and that it will be submitted to Mayor Puchta for approval before May 15. The plan will go into effect as soon as it is approved. Until a street railway commissioner is appointed the Mayor will act in that capacity.

Another Company Opposes Rowdyism.—The Philadelphia & West Chester Traction Company, Upper Darby, Pa., has placed officers on its interurban cars with instructions that all men who show the least sign of intoxication be put off the cars, or, if their condition is detected, they should not be allowed transportation. Officials of West Chester hail the move with approval, and the work will be continued until the riding is made safer and more comfortable for desirable patrons.

Spokane Jitneys Refuse to Obtain Bonds.—About fifty members of the Individual Auto Owners' & Chauffeurs' Union of Spokane, Wash., have secured a temporary injunction in the Superior Court, which prevents officials from arresting them for operating jitneys without bonds. It is alleged that bonds cannot be secured, but the jitney men are willing to carry liability insurance. In all 100 jitneys are operated in that city without bonds. It is declared that the bond requirement would destroy the business of the jitneys, as all the bonds expire during the next four months. The Spokane jitneys have carried 12,000 passengers daily for two years.

Would-Be Jitney Operators Ignored.—The Public Utilities Commission of the District of Columbia has received applications from more than 250 operators of motor vehicles for permission to operate over periods varying from one round trip a day to regular and frequent trips, and in many cases paralleling the routes of street railways. The commission felt that the large number of applications resulted from the conditions incident to the strike of trainmen of the Washington Railway & Electric Company, Washington, D. C., which was declared on March 12. It was thought probable that these operators would not establish permanent routes, and no action was taken. The commission held that the applicants should be required to secure the usual licenses to operate vehicles for hire.

"Famous Stops" Condemned.—In a recent efficiency talk addressed to car men, G. B. Powell, superintendent of employment of the Louisville (Ky.) Railway, denounced the practice of stopping unnecessarily at carhouses. Mr. Powell said: "The stop at the carhouse is not only famous but has become notorious. To be sure, you must have coal, sand, change, transfers, etc., but why not see that you have a supply of all these things before you start out? In fact, you are required to do so. One minute seems ten to passengers when the stop is made at the carhouse, and especially is this so when the minute drags into two or three while the members of the relief crew finish a game of checkers, put on their coats, comb their hair, brush their shoes, and finally arrive on the street where they should have been when the car was due."

Patrons Object to Tariff.—A complaint signed by more than 150 residents of the vicinity of Horseheads against the Elmira Water, Light & Railroad Company, Elmira, N. Y., has been received by the Public Service Commission for the Second District of New York which asks for the establishment of a 5-cent fare between Horseheads and Elmira, for a fifteen-minute schedule between those places from 5 to 6 p. m., and that the company be compelled to restore the use of ticket books. The tariff under which the ticket books were withdrawn went into effect on Feb. 15, after the regular thirty-days' notice, the effect of which was to increase the fare between Horseheads and Elmira from 7.14 cents to 10 cents. The complainants have been informed that the tariff must remain in effect pending investigation. The complaint has been served on the company and a hearing will undoubtedly follow.

Discontinuance of Crossing Tenders Permitted—The Public Service Commission of Massachusetts has authorized the Bay State Street Railway, Boston, Mass., to discontinue the services of special crossing tenders at the Main Street crossing of the Boston & Maine Railroad, in Wilmington, and at the Central Street crossing of the New Haven road in East Bridgewater. About fourteen trains a day pass these crossing at low speed, and the railroad companies also protect each with a flagman from about 6 a. m. to 7 p. m. The board will require the company to install a wire trolley guard over each crossing, and to make a regular stop within 100 ft. of the track, the conductor to signal the motorman and remain on the track until the car has passed. The board denied the company permission to discontinue a special crossing tender in Winchester on account of the large amount of traffic concerned.

Fare Controversy in Duluth.—The City Council of Duluth, Minn., has proposed that the Duluth Street Railway be compelled to reduce street car fares in that city, since the Public Affairs Committee granted the company permission to double the present 5-cent fare on its Morgan Park line. The agreement was that the line would be extended from Morgan Park to New Duluth, a distance of about 3 miles. With the extension of the system the outlying districts would no doubt be built up and be a source of greater revenue, but the company's financial condition was such that it could not undertake the work on a single-fare basis. The City Council opposed the measure and adopted unanimously a resolution requesting the railway to limit its fares on all lines to 5 cents. On April 16 City Attorney Samuelson, after investigating the company's franchise, stated that in his opinion the Council had no authority over the fares outside the city limits. The only recourse left to the city was to exercise its authority to regulate the city fare and proposed to have it reduced to 3 or 4 cents.

Buses Operate Pending Decision.—Until the Supreme Court of Washington hands down a decision in a case now pending, the Ferry Line Auto Bus Company, operating in West Seattle, will do business without a license, and the injunction granted recently by Judge Everett Smith in the Superior Court, as noted in the Electric Railway Journal for April 28, page 802, prevents the State and county authorities from interfering. The company refused to pay the annual fee charged auto stage lines on the ground that it is not a stage line. It had offered to pay the fee for operating vehicles for hire, but this was not accepted. The company was fined $50 in the Justice Court for operating without a license and on appeal to the Superior Court it was fined $150. The case then went to the Supreme Court, to determine whether, under the laws of 1915, the line is a stage line. The 1917 law specifically states that bus lines, operated within city limits, do not come under the classification of stage lines, but this law will not be in effect until June 12.

Legal Notes

ALABAMA.—*Company Not Responsible for Collision with Trailer.*

A motorcycle rider, whose machine was not struck by the motor car of a two-car train but by the trailer, could not recover, since he, and not the car, must have brought about the accident. (Hamilton v. Birmingham Railway, Light & Power Co., 72 Southern Rep., 950.)

MAINE.—*Shipper's Employee on Top of Car—Trespasser or Licensee.*

In an action against a railroad for death of the employee of a potato growers' association, fitting a car for the shipment of potatoes, who came in contact with the road's trolley wire when he climbed to the top of the car to release the brake, evidence held to show that at the time of the accident deceased was either a trespasser or a mere licensee, toward whom the road was guilty of no breach of duty. (Allen v. Aroostook Valley R. R., 98 Atlantic Rep., 1027.)

MARYLAND.—*Injury to Passenger When Car Starts.*

To start an electric car while a passenger is in the act of stepping from the rear platform into the car is not negligence, in the absence of any unusual circumstance or condition. (Brocato v. United Railways & Electric Co., 99 Atlantic Rep., 792.)

NEW JERSEY.—*Inviolability of Fare Contract.*

When a traction company organized under the general traction act of 1893 (P. L. page 302; Comp. St. 1910, page 5021), accepts from a municipality an ordinance granting a location of street railway tracks, a regulation of the rate of fares contained therein, if lawful and reasonable, constitutes a contract between the company and the municipality which during the life of the franchise remains inviolable, and it is incompetent for the board of public utility commissioners or the municipality to impose upon the company an additional burden in violation of such contract respecting fares. (Atlantic Coast Electric Railway v. Board of Public Utility Commissioners, 99 Atl. Rep. 395.)

NEW JERSEY.—*Provisions of Traffic Act Not Applicable to Electric Car at Crossing.*

The provisions of paragraph 1 of section 4 of the Traffic act of 1915 (P. L. p. 285), requiring every driver of a vehicle approaching the intersection of a street or public road to grant the right of way at such intersection to any "vehicle" coming from the right, does not impose this duty upon the motorman of a street car. (Reed v. Public Service Ry., 99 Atlantic Rep., 100.)

NEW YORK.—*"Refusal" Must Be Actual Denial.*

A carrier, whose conductor through inadvertence and mistake during a busy time punched the wrong expiration time on a transfer issued to a passenger, does not thereby become liable for the penalty imposed by Public Service Commissions Law (Consol. Laws, chap. 48, sec. 49, subd. 7), for the refusal to comply with the requirements of that section as to the issuance of transfers, since to "refuse" connotes something affirmative, to deny, to decline, to reject, not merely negatively to fail. (Osborn v. International Ry., 161 New York Sup., 1042.)

OHIO.—*Duty of County Commissioners to Maintain City Bridge.*

Where a franchise to construct and operate an electric railway on a free turnpike is granted by a board of county commissioners, one of the conditions of which is that the railway shall maintain and repair all the bridges over the route at its own expense, and under the direction of the county engineer and commissioners, the fact that territory embracing a portion of the turnpike, which includes a bridge theretofore erected by the county commissioners, is duly annexed to a city, does not relieve the commissioners of their duty to maintain the bridge nor serve to transfer to the city authorities any of the rights or benefits accruing to the commissioners under such contract. (Interurban Railway & Terminal Company v. City of Cincinnati, 114 Northeastern Rep., 258.)

Personal Mention

Charles S. Hervey has been reappointed to serve another term on the Public Service Commission of the First District of New York.

Alfred S. March, of New Brunswick, on May 1 succeeded John J. Treacy as a member of the Board of Public Utility Commissioners of New Jersey.

O. R. Sturzinger has resigned as superintendent of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, which office was abolished.

J. B. Ledlie, assistant electrical engineer for the Northern Texas Traction Company, Fort Worth, Tex., has been promoted to succeed E. E. Nelson as electrical engineer.

W. H. Douglass has resigned as superintendent of the Northern Ohio Traction & Light Company, Akron, Ohio, to become general superintendent of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio.

John H. Cain, assistant superintendent of transportation of the Rochester Lines of the New York State Railways, has been appointed superintendent of the employment bureau, succeeding George Lawson, resigned.

Arnold Swain has been appointed assistant treasurer of the Key West (Fla.) Electric Company, to succeed R. C. Shepard, who was transferred to the office of the treasurer of the Stone & Webster Management Association, Boston, Mass.

Edward Flad, consulting engineer, St. Louis, has been appointed to succeed John Kennish on the Public Service Commission of Missouri. Mr. Kennish will resume the practice of law in Kansas City after a few months of traveling in the West.

Roydan Douglas and **V. K. Irion**, members of the Public Utilities Commission of New Orleans, La., have been appointed members of the special commission to investigate transportation conditions in that city. All the members of the board are now on the special commission.

Noah W. Simpson, secretary to the Governor of Missouri, has been made successor to Howard B. Shaw on the Public Service Commission of that State. Mr. Simpson was formerly prosecuting attorney of Lewis County, and served one term as representative in the State Legislature.

Newton M. Hudson has been appointed receiver of the Central Park, North & East River Railway, succeeding John Beaver, deceased, and not of the Second Avenue Railroad, New York, N. Y., as reported last week. Mr. Hudson is auditor of the latter road and continues in that capacity.

J. J. Chisholm has been appointed superintendent of power of the New Orleans Railway & Light Company, New Orleans, La., to succeed E. B. McKinney, who had been with the company more than twenty years. Mr. Chisholm was formerly superintendent of power of the Tennessee Coal & Iron Company in Birmingham.

F. S. Richards has been appointed cashier and assistant treasurer of the Brooklyn (N. Y.) Rapid Transit Company, succeeding W. J. O'Neill, deceased. Mr. Richards began his services with the Brooklyn company as clerk in the treasurer's department in 1898, and four years later was made assistant cashier, the position he has just resigned.

Charles Whiting Baker has retired from the position of editor of *Engineering News-Record* and has become consulting editor of the paper. Frederick E. Schmitt, who was associate editor of *Engineering News* from 1902 until its consolidation with *Engineering Record* as *Engineering News-Record* a few weeks ago, succeeds Mr. Baker as editor.

George H. Ross, Jr., has resigned as superintendent of the railway and gas departments of the Trinidad Electric Transmission Railway & Gas Company, Trinidad, Col., to accept a government position in the engineering department of the Newport News Shipbuilding & Dry Dock Company, Newport News, Va., for the period of the war. Mr. Ross intends to return to electric railway work.

E. E. Nelson, for the last eleven years electrical engineer for the Northern Texas Traction Company, Fort Worth, Tex., has entered the service of the Adirondack Electric Power Corporation at Utica, N. Y. Before his departure a banquet was tendered him by officials and employees of the company, who presented him with a gold watch and chain as a token of their esteem.

George Carson, claim agent of the Fifth Avenue Coach Company, operating buses on Fifth Avenue, New York, N. Y., was the subject of a complimentary sketch in the April number of *Bus Lines*, that company's publication. Mr. Carson is an expert in safety and accident-prevention work, having been one of the first to originate safety committee organizations as applied to electric railways.

R. R. Hadsell has been appointed assistant superintendent of transportation of the New York State Railways, Rochester Lines. Mr. Hadsell was formerly division superintendent of the United Traction Company, Albany, N. Y. He started his electric railway career as a conductor for the International Railway, Buffalo, N. Y., in 1901, and remained with that company for three years, when he resigned to become inspector of city lines for the Schenectady (N. Y.) Railway. In 1913 he entered the service of the United Traction Company in the position which he has just relinquished.

H. C. Morris, general manager Dallas (Tex.) Gas Company, was elected president of the Southwestern Electrical & Gas Association at its annual meeting in Dallas, held on April 26-28. Mr. Morris was born in Detroit in 1879, and entered the service of the Detroit City Gas Company in 1898. For two years following 1902 he was superintendent of the Saginaw (Mich.) City Gas Company, and thereafter until 1908 he acted as assistant general manager of the Bay City Gas Company and the Bay City Traction & Electric Company. He then went to Dallas as superintendent of the Dallas Gas Company, with which he is now connected, and was later made general manager.

John O. Wiegel has been appointed acting general superintendent of the International Railway, Buffalo, N. Y., to succeed Nelson H. Brown, resigned. Mr. Wiegel went to Buffalo several months ago to become superintendent of schedules, having resigned as chief of the time-table department of the Brooklyn (N. Y.) Rapid Transit Company. His twenty years of electric railway work were begun in Brooklyn in the shops and he steadily worked up through the ranks to his last position. Scientific schedule making was early adopted on the Brooklyn Rapid Transit System and was inaugurated under Mr. Wiegel's supervision with marked results. He has already effected changes in the service of the International Railway to relieve the present traffic situation in Buffalo.

William F. Stanton, who was formerly assistant to the general manager of the Schenectady (N. Y.) Railway, has accepted a position as assistant to James F. Hamilton, general manager of the New York State Railways, Rochester Lines, who was until recently general manager of the former road. Mr. Stanton began his railway career in 1904 with the Schenectady Railway. After three years of service in various capacities in the clerical department he held the position of secretary to the general manager for several years. Mr. Stanton is secretary-treasurer of the New York Electric Railway Association. He was elected to that office in 1915 well qualified for its responsibilities, as he had been for a few years previously secretary to two presidents of the association, Messrs. Peck and Hamilton. By reason of his central location and familiarity with the New York association he has served it in addition to his other duties and has shown an unusual interest in its affairs.

J. F. Uffert, formerly master mechanic of the United Traction Company, Albany, N. Y., has accepted a similar position with the New York State Railways, Rochester Lines, succeeding G. M. Cameron. Mr. Uffert was born in Newark, N. J., in 1880 and began railway work with the Consolidated Traction Company of that city, now a part of the Public Service Railway. He then served as shop foreman a few years for the Union Railway, New York, after which he went West to become assistant superintendent of equipment for the Tacoma Railway & Power Company and the Puget Sound

Electric Railway of Tacoma, Wash. Mr. Uffert became master mechanic of the United Traction Company in 1912 after serving for one year in that capacity for the Hudson Valley Railway, Glens Falls, N. Y., both subsidiaries of the Delaware & Hudson Railroad.

J. B. Stewart, Jr., has been appointed assistant to the general manager of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. Mr. Stewart is a graduate of the High School at Newton, Mass., and the Massachusetts Institute of Technology. He entered the railway field as an engineer for the Middlesex & Boston Street Railway, Newtonville, Mass., and left that company to accept a position as assistant to the general manager of the Buffalo & Lake Erie Traction Company at Erie, Pa. In 1910 he was engaged on the construction of the Corning division of the Elmira, Corning & Waverly Railroad, Waverly, N. Y., later becoming superintendent. Two years later Mr. Stewart joined the organization of the Lehigh Valley Transit Company, Allentown, Pa., as park manager and acted as assistant to the traffic manager. He has been with the company which now employs him since 1913, serving in the capacities of safety and efficiency engineer and superintendent of freight, and just previous to his recent appointment he was superintendent of equipment and traffic.

N. H. BROWN

Nelson H. Brown has been transferred from his position as general superintendent of transportation of the International Railway, Buffalo, N. Y., to that of manager of the electric railway properties of the New Orleans Railway & Light Company, New Orleans, La., both subsidiaries of the United Gas & Electric Corporation. In appreciation of his services and as an expression of the esteem in which he is held by officials and department heads of the International Railway, he was presented with a diamond ring and a set of diamond cuff links. Mr. Brown began his service with that company four years ago and was successively assistant superintendent and superintendent of the Buffalo division and finally general superintendent of the company. He has had a wide and varied experience in railway service, which he began in the mechanical department, and later as a fireman for the New York Central Railroad. Other lines with which he has been connected are the Consolidated Street Railway, Syracuse, N. Y., and its successors, the Syracuse Rapid Transit Company, the Worcester (Mass.) Consolidated Street Railway, the Worcester & Southbridge Street Railway and the Albany (N. Y.) Southern Railway. Many changes and improvements in the International Railway can be credited largely to Mr. Brown's able management.

Obituary

Mark Lowd, southwestern manager of the Stone & Webster Engineering Corporation, died of pneumonia at his home in Dallas, Tex., on April 27. Mr. Lowd was born in Salem, Mass., in 1870. After completing the Salem High School course he spent three years in the United States Naval Training School at Newport. He then took a course with the Thomson-Houston Electric Company, and several years later became associated with C. E. Hubbard in Boston, Mass., on the work of perfecting the third-rail system. He next entered the employ of the Narragansett Electric Light Company at Providence, R. I., and in 1902 became associated with Stone & Webster as chief engineer and superintendent of construction for the Seattle (Wash.) Electric Company. Mr. Lowd had been Southwestern manager for the Stone & Webster Engineering Corporation since 1907, with the exception of two years, when he was transferred to Galveston to supervise the construction of the Galveston-Houston interurban.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***South Florida Interurban Railway, St. Cloud, Fla.**—This company, organized under the laws of Arizona, has filed a charter with the Secretary of State of Florida for the purpose of constructing an electric railway from Melbourne west to Haines City, north to St. Cloud, Orlando and Sanford, thence west through Marion, Lake and Citrus Counties on the west coast, entering Tampa from the north and finally completing the loop at Haines City. Headquarters are at St. Cloud. Officers: Charles D. Brenner, president; John H. Bowlin, vice-president; Frederic B. Stanley, treasurer, and William Hall, secretary.

***Charleston-Gauley Electric Railway, Charleston, W. Va.**—Incorporated in West Virginia to construct a line from Charleston along the north bank of the Kanawha River to Gauley bridge, about 35 miles. Capital stock, $100,000. Charles C. Dickinson, president. Incorporators: George P. Alderson, George B. Brooks, John Y. Arter, B. T. Clayton and J. H. Nash, all of Charleston.

FRANCHISES

Little Rock, Ark.—The Little Rock Railway & Electric Company has received a franchise from the City Council to double-track its Pulaski Heights line on Prospect Avenue from Lee Avenue to I Street.

Victoria, B. C.—The British Columbia Electric Railway Company, Ltd., has asked the City Council for a franchise to double-track part of its line on Esquimalt Road.

Evanston, Ill.—The Evanston West Side Railway has asked the City Council for a franchise to construct a double-track line on Howard Street to Asbury Avenue, north on Asbury Avenue to Crain Street, west on Crain Street to Ashland Avenue and north on Ashland Avenue to Church Street; also two cross-town branches, one on Main Street to the western city limits, and one on Church Street to the western city limits. Clement C. Smith, president of the Evanston Railways, is the promoter of the new road. [Feb. 17, '17.]

Wilmette, Ill.—The voters of Wilmette, at a recent election, defeated the ordinance passed by the village board granting the Chicago, North Shore & Milwaukee Electric Railroad a twenty-year extension of its franchise. The company's present franchise has six years more to run.

Ithaca, N. Y.—Looking toward the most important improvements for the city of Ithaca that have been undertaken in recent years, the Common Council by a vote of eight to two, recently granted two franchises to the Central New York Southern Railroad and the Ithaca Traction Corporation. The two franchises include one permitting the Central New York Southern Railroad to enter the city of Ithaca by a new route in the northwestern section and another granting to the Ithaca Traction Corporation the privilege to operate its cars over the Central Southern lines within the city limits. The two railway corporations plan to expend several hundred thousands of dollars in improvements.

New York, N. Y.—The Union Railway has received a franchise from the Board of Estimate and Apportionment to construct and operate a trolley line connecting with its present system at the 207th Street bridge and continuing along Amsterdam and Nagle Avenues to the Dyckman Street ferry. Construction on the new line will be begun at once, and it is expected that operation will be begun by June 15.

Salt Lake City, Utah.—The Salt Lake & Utah Railroad has asked the City Commission for a franchise to construct a line on Seventh West Street from South Temple Street to the south limits of the city.

Tacoma, Wash.—The Tacoma Railway & Power Company has asked the County Commissioners for an extension of its franchise so as to include Browns Point and practically all the territory between Tacoma and the King County line.

Tacoma, Wash.—The City Council of Tacoma, Wash., recently voted to ask Pierce County for a twenty-five-year franchise, giving the city the right to lay and maintain a single or double track with proper sidings and to operate an electric railway on South Eleventh Street from Sitcum Avenue to Commencement Bay Boulevard, thence to Lincoln Avenue; along Lincoln Avenue to Twenty-first Street; thence on Twenty-first Street to the city limits; also along the proposed street when opened between South Eleventh Street and Lincoln Avenue, near the Hylebos Creek Waterway.

TRACK AND ROADWAY

***Cascade Scenic Railway, Banff, Alta.**—Work will probably be begun this year by the Cascade Scenic Railway on the construction of a railway up the mountain near Banff. Harold Johnson, engineer.

Edmonton, Alta.—A communication from the Delta Copper Company, Edmonton, states that the company does not contemplate the construction of an electric railway, as reported in the ELECTRIC RAILWAY JOURNAL for March 24.

Visalia Electric Railroad, Exeter, Cal.—A contract has been let by the Visalia Electric Railroad to O. Ford, Riverside, for 6 miles of roadbed about 4 miles southeast of Portersville, 4½ miles of which will be main line and 1½ miles a branch line to rock quarry.

Pacific Gas & Electric Company, Sacramento, Cal.—It is reported that the Pacific Gas & Electric Company will reconstruct its entire system in Folsom.

West Coast Electric Railway, Sarasota, Fla.—This company's proposed line from Tampa to Venice will be built via either Bayshore or Parish. Three steel bridges will be built in connection with the line. Construction bids will be asked immediately after local work is finished. It is reported that the line will be operated with Edison storage-battery cars. E. M. Raymond, 1323 Land Title Building, Philadelphia, Pa., president, and A. E. Townsend, Sarasota, Fla., general manager and chief engineer. [Feb. 3, '17.]

Tampa & Eastern Traction Company, Tampa, Fla.—Work on this company's electric line between Tampa and Lakeland has been temporarily discontinued, according to E. J. Binford, vice-president of the road, because of the war situation. Much filling and grading have been done on the right-of-way and some of the ties for the road have been laid, although no tracks have been put down as yet. [Oct. 28, '16.]

Caldwell (Idaho) Traction Company.—Walter R. Sebree, president of the Caldwell Traction Company, reports that the company plans the bonding of its properties for $100,000 for the purpose of electrifying its Wilder branch and extending the present lines. The construction of a loop extending through the Gem District and connecting the Lake Lowell branch of the system with the Wilder branch, the latter crossing the Snake River near Homedale, is planned.

Fort Wayne & Decatur Traction Company, Fort Wayne, Ind.—This company has petitioned the Public Service Commission of Indiana for permission to issue $100,000 in bonds, part of the proceeds of which will be used for extensions and improvements.

Arkansas Valley Interurban Railway, Wichita, Kan.—Rails have been delivered and ties ordered for an extension to be built this summer by the Arkansas Valley Interurban Railway. Negotiations are now under way to construct industrial tracks to various points now being built and work is being done on right-of-way that will change the route of the cars through the city of Wichita. Instead of passing through the city on the main street, as now, the extension planned will route the cars west of the town to a connection with the Midland Valley Railroad. The passenger cars will reach the union station over tracks of the Wichita Railway & Power Company, and will loop back by the site of a projected $1,000,000 hotel.

***Wichita-Walnut Valley Interurban Railway, Wichita, Kan.**—This company has been organized at Wichita with an initial capital stock of $1,000,000 to construct an electric railway from Wichita to the oil fields of Butler County, about 35 miles. Two routes are under consideration, one from Wichita to El Dorado, via Augusta; the other through Andover, Benton and Towanda to El Dorado. Regular passenger and freight service will be established. It is expected that construction work will be begun early in the summer. Temporary officers were elected as follows: J. H. Butts, president; T. C. Coffman, secretary, and L. S. Naftzger, treasurer.

Ashland, Ky.—Powell & Clarke, Ashland, have been engaged as engineers for the proposed electric railway to be built from Ashland to Russell, about 5 miles. The Vaughan Construction Company, Shawsville, Va., has the contract for the construction of the road. The line may be extended to Greenup, 10 miles distant. [April 7, '17.]

Paducah (Ky.) Traction Company.—Work has been begun by the Paducah Traction Company double-tracking its line from Eleventh to Seventeenth Street on Broadway.

Detroit (Mich.) United Railway.—Grading has been begun by the Detroit United Railway on its extension from Highland Park to Royal Oak. The line will extend out on Oakland Avenue, and the entrance into Royal Oak is planned to be on Fourth Avenue.

Billings (Mont.) Traction Company.—A company headed by several local bankers and capitalists has been formed at Billings with a capital stock of $500,000 to take over the property of the Billings Traction Company. The present system will be electrified and the lines extended.

Woodbury, N. J.—It is reported that right-of-way has been obtained for the construction of an electric railway from Woodbury to Paulsboro. It is proposed to build the line out West Center Street, across the Bell tract and strike the Crown Point road in a direct line. A committee has been appointed by the City Council to work in conjunction with the Board of Trade. [Dec. 2, '16.]

New York State Railways, Utica, N. Y.—The Public Service Commission for the Second District of New York has ordered the New York State Railways to rebuild its track in Main Street, Whitesboro. The order of the commission requires that one-half of the work be done during 1917 and the remainder next year, and that pending the completion of the new track the old track must be kept in a condition adequately safe for the operation of cars.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—Judge Phillips, of the Common Pleas Court, recently rendered a decision giving the Cleveland, Southwestern & Columbus Railway the right to build its track across land leased from the West Cuyahoga County Agricultural Society. The County Commissioners brought suit to enjoin the company from using the land. This will enable the company to complete construction of its tracks around the village of Berea, where it was refused a renewal of franchise unless a reduction of fare was made between that point and Cleveland.

Lake Shore Electric Railway, Cleveland, Ohio.—Application has been made by the Lake Shore Electric Railway to the Public Utilities Commission of Ohio for authority to issue $51,000 in bonds, the proceeds to be used for improvements, etc.

Springfield (Ohio) Railway.—H. J. Crowley, general manager of the American Railways Company, which controls the Springfield Railway, has announced that an extension will be built to the Northern Heights addition this year. It was stated that other extensions planned for this year would probably not be made, owing to the steel shortage.

Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio.—This company has petitioned the Public Utilities Commission of Ohio for permission to issue $68,000 in bonds, the proceeds to be used for extensions and improvements to its system.

Youngstown & Suburban Railway, Youngstown, Ohio.—The Municipal Service Corporation, Philadelphia, which recently purchased the Youngstown & Suburban Railway, plans a number of improvements in the line.

Tulsa (Okla.) Street Railway.—Work will be begun at once by the Tulsa Street Railway double-tracking a large part of its system in Tulsa.

London & Port Stanley Railway, London, Ont.—Bids will soon be asked by the London & Port Stanley Railway for 30 tons of 80-lb. rail for switching lines. J. E. Richards, London, manager.

*__Klamath Falls, Ore.__—The City Council of Klamath Falls has asked for bids for the construction of a municipal railway to extend from Second Street and Klamath Avenue to a point near Dairy, 20 miles east of Klamath.

Philadelphia, Pa.—Bids were opened by the Department of City Transit on May 1 for foundation work on the Frankford elevated line. Edwin H. Vare presented a substitute bid for work upon which he bid $17,700 about a year ago. Two weeks ago he informed transit officials that the figures were far too low in view of advanced prices and asked permission to submit a new bid. This he did, the figures reported on May 1 being $37,750.

Dallas Northwestern Traction Company, Dallas, Tex.—A charter has been granted by the State Department to the Standard Utilities Construction Company, which is organized for the purpose of constructing the proposed electric railway of the Dallas Northwestern Traction Company from Dallas to Slidell, via Denton, about 58 miles. Capital stock, $100,000. Incorporators: M. W. Deavenport and H. Rowe, Denton; Ira E. Cornelius, Muskogee, Okla., and C. F. Hopkins, Tulsa, Okla. [April 14, '17.]

Northern Texas Traction Company, Dallas, Tex.—This company has been ordered by the City Commission of Dallas to reconstruct its tracks on Tyler Street between Seventh and Tenth Streets, and on Seventh Street between Bishop and Tyler Streets. Heavier ties laid on concrete foundation in connection with the laying of pavement on these streets are ordered.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company will construct an extension of its East Union Street line from Twenty-ninth Avenue to a connection with the Madrona Park line at Thirty-fourth Avenue.

Appalachian Power Company, Bluefield, W. Va.—It is reported that this company contemplates the extension of its line from Bluefield to neighboring sections, including about 40 towns, covering a distance of about 50 miles.

SHOPS AND BUILDINGS

Indiana Railways & Light Company, Kokomo, Ind.—The first move toward a larger terminal station in Kokomo has been made with the sale of the present station building of this company to T. C. Rapp, president of the American Trust Company. It is reported that George J. Marott, president of the Indiana Railways & Light Company, has acquired title to the ground at the southwest corner of Union and Superior Streets. The construction of the new station is in keeping with a line of improvements which will involve the expenditure of $150,000. New machinery for the power plant, most of which has already been purchased, extensions to the city street car line in Kokomo and electric light improvements are parts of the program.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—Work has been begun by this company on its new passenger and freight station at Brocton.

Ithaca (N. Y.) Traction Corporation.—A new station to cost about $50,000 will be erected by the Ithaca Traction Corporation and the Central New York Southern Railroad at the corner of State and Meadow streets.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York is advertising for bids to be received by May 16 for the construction of station finish on the nine stations on the new subway lines in Flatbush Avenue and Eastern Parkway, Brooklyn. One of the nine stations, that at Seventh and Flatbush Avenues, will be operated by the New York Municipal Railway Corporation, as it is located on the line of the connection now being constructed between the Brighton Beach line and the Fourth Avenue subway. The remaining eight stations are all on the subway line to be operated by the Interborough Rapid Transit Company in Flatbush Avenue and Eastern Parkway. The structure in Flatbush Avenue is six tracks in width, four of which are for operation by the Interborough Rapid Transit Company and two by the New York Municipal Railway. The commission has also awarded to John B. Roberts, New York City, a contract for the construction of station finish for three stations on the Manhattan portion of the Park Place, William and Clark Street subway. The contract price for the work was $139,919.

Philadelphia, Pa.—Director Twining, of the Department of City Transit, Philadelphia, rejected as too high the bid of the McClintock-Marshall Company resubmitted on May 1 for the construction of a steel station at Huntingdon Street. Sealed proposals for this station will be received by the Department of City Transit until May 15.

Jefferson County Traction Company, Port Arthur, Tex.—A contract has been awarded by the Jefferson County Traction Company, owned by the Eastern Texas Electric Company, to the Secrist Construction Company, for the construction of a brick and tile interurban station.

POWER HOUSES AND SUBSTATIONS

Edmonton (Alta.) Radial Railway.—The installation of a motor generator set by the Edmonton Radial Railway, to cost $6,100, has been recommended by J. H. Moir, traffic manager.

Fort Smith Light & Traction Company, Fort Smith, Ark.—This company will construct a 30-mile transmission line to supply Huntington and Greenwood from its Fort Smith plant. All contracts for material have been closed.

Pacific Gas & Electric Company, Sacramento, Cal.—This company is reconstructing the substation on the Marysville Road, Oroville, which was destroyed about two years ago. Work has also been begun by the company on the reconstruction of its plant at the foot of Huntoon Street. The lighting equipment in the business section of Oroville will be replaced with a modern system.

Georgia Railway & Power Company, Atlanta, Ga.—This company is erecting a new 110,000/38,000-volt substation at Norcross to feed the Stone Mountain line. The line from Norcross to Stone Mountain will be 10 miles long. The station will be equipped with two banks of three 1000-kva. General Electric transformers, with one spare for each bank.

Illinois Northern Utilities Company, Freeport, Ill.—Contracts have been awarded by the Illinois Northern Utilities Company for the erection of a new $70,000 steam power plant in Dixon. The Adams Construction Company, Chicago, received the contract for the substructure and superstructure at $45,000, and the Lakeside Bridge & Iron Company, Milwaukee, received the contract for the structural steel work at $23,000.

Springfield (Mass.) Street Railway.—Arrangements have been made by the Springfield Street Railway under which power for its entire system will be secured from the Turners Falls Power & Electric Company. The engine-driven plant in Springfield will be shut down and a modern substation system provided. As announced in the ELECTRIC RAILWAY JOURNAL of April 21, page 748, President Cabot of the Turners Falls company has stated that within the next two or three years about $3,000,000 will be expended in the extension of the generating and transmission facilities of that company.

Interborough Rapid Transit Company, New York, N. Y.—Improvements are contemplated by the Interborough Rapid Transit Company to its substation on Nineteenth Street, to cost about $15,000.

Sand Springs Railway, Tulsa, Okla.—This company has purchased from the Westinghouse Electric & Manufacturing Company a 3125-kva. turbine unit, a duplicate of the one now being installed. The company now has three units, a total of 7500 kva.

Lehigh Valley Transit Company, Allentown, Pa.—A new 15,000-hp. turbine for the Lehigh Valley Transit Company's plant in Allentown has been completed by the Westinghouse Electric & Manufacturing Company and this will bring the capacity of the plant up to 45,000 hp. It is reported that increased demand from the electric railway and from industrial establishments in the Lehigh region will absorb all the added power.

Harrisburg (Pa.) Railways.—Extensions and improvements in its power plants are being considered by the Harrisburg Railways.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Helping to Reduce Selling Costs

Economizing Time of the Purchasing Agent and the Salesman—Old-Fashioned Salesmen Being Supplanted Rapidly

By W. V. C. Buckeley
Purchasing Agent Columbus Railway, Power & Light Company

I have read the article by L. W. Horne in the issue of the Electric Railway Journal for April 14, and agree with him absolutely that the consumers must pay all selling expenses. When salesmen are delayed, the selling expenses are increased, and this necessarily increases the cost of the article sold.

I make it a practice to save as much of a salesman's time as possible, by having definite office hours printed on my letterhead, stating the time at which I shall see all salesmen that come into the office. Inasmuch as my duties take me from the office every afternoon, this saves the salesmen the time that otherwise would be lost at finding me absent. In cases where it is necessary to give any particular attention to an order, I make an appointment for the afternoon. This clears the way for other salesmen whom we can interview quickly during the morning office hours.

I have no hesitancy in turning down a salesman flatly and offering him absolutely no encouragement in case his product does not appeal to me. I have noticed that there are a number of salesmen, in fact, quite a large number, who have the idea that the purchasing agent is all wrong if he does not buy their particular goods inasmuch as they represent the very best in that particular line, etc. Conversation of this sort unnecessarily takes up the time of both the salesman and the purchasing agent. The manufacturing concerns are realizing that the snappy, up-to-the-minute salesman, although he may cost more in the way of salary, is really most efficient in the end. This type of salesman helps to reduce the selling cost, as he gives the purchasing agent more time to himself which, in turn, will insure that he can give the salesmen more prompt attention.

Another method by which I exert an effort to reduce selling costs is through the forwarding of a bid form for products that I buy to the different manufacturing concerns on my list. A 2-cent stamp placed on the envelop to return this bid form to me is just as efficient and reliable as the call of the salesmen, and in some cases more so. I do not under any consideration accept a second price from any one competitor without giving the same chance to all other competitors, and a second price is not accepted unless the market conditions warrant such change. I feel that when salesmen know that they have but one chance to figure on an order, they will submit their best price first, and this, of course, saves considerable time, both on the part of the buyer and seller.

Steel Pole Prices Make History

Even at Top Notch Prices Inquiries Are Frequent for Large Lots—Range of Prices Given for Twenty-two Years

Very few tubular steel poles are now available for purchase. The manufacturers of skelp suitable for steel poles are in the midst of the most congested period of the steel industry and hesitate to make any promises for future delivery. Also, the government has indicated to some manufacturers that it may require part or all of their productive capacity, and this prevents the manufacturers from contracting for any orders which might interfere with government requisitions. The makers of steel poles are now beset with prospective purchasers of flagpoles. These poles are made from the large size tubing such as is used for the manufacture of trolley poles.

Prices Continue to Climb

The exact situation is clearly indicated by the fact that some manufacturers have been forced to refuse orders for steel poles in lots of 500 or more from single purchasers. This is in spite of the high cost of pole steel, which is $6.50 per 100 lb. The need for placing purchases early, even at present prices, is evident from the statement of one large pole manufacturer, who, with single poles at from $85 to $90, has issued quotations on more than his available stock. Steel poles are now being quoted at the highest prices ever reached, and owing to the general steel market situation no manufacturer is in a position to make quotations except for immediate acceptance.

Through the courtesy of A. L. Johnston, sales manager of the Electrical Engineers Equipment Company, Cincinnati, Ohio, this paper has been supplied with the accompanying statement of this company's average yearly selling prices on standard-weight tubular steel poles for each year since 1895. These prices are reproduced here because of their value for appraisal purposes and to show how present prices are far in excess of any in previous years. The quotations are for standard-weight poles per 100 lb.:

1895....	$2.40	1900....	$3.50	1905....	$2.70	1910....	$2.35
1896....	2.30	1901....	3.25	1906....	2.80	1911....	2.30
1897....	2.00	1902....	3.50	1907....	3.25	1912....	2.30
1898....	1.90	1903....	3.20	1908....	3.00	1913....	2.40
1899....	4.00	1904....	2.85	1909....	2.40	1914....	2.20

For the year 1915 the price averaged $2.35 per 100 lb. until Nov. 17 and then rose to $2.40. And for 1917 prices ranged from $2.40 in January to $3.65 in April and later to $5 for stock shipments. This price ruled for January, February and March, 1917, for such stock as the manufacturer had in hand. The price now is about $6.50, and no quotations can be made for the future.

Regulating Coal Prices

Philadelphia Paper, Recognizing Plight of Some Utilities, Suggests Compulsory Standardization of Coal Prices

The problem that confronts the electric railways in securing a continuous supply of steam coal at reasonable prices was recently called to the attention of the readers of the Electric Railway Journal in an interview which appeared on page 623 of the March 31 issue by Frank J. Petura, purchasing engineer of the Doherty Operating Company, New York. The first difficulty that the electric railways experienced in connection with their coal supply was that growing out of the car shortage last fall. At that time some companies in the Middle West were compelled to go out into the open market and purchase coal at prices two or three times greater than those normally obtaining under long-time contracts. Another company with a contract which expired recently succeeded in renewing its contract, but at prices considerably in advance of those that prevailed before. Last week mention was made in these pages of four interurban roads in Indiana combining in self-defense to finance a coal-mining proposition. These roads are the Terre Haute, Indianapolis & Eastern Traction Company, the Indianapolis Traction & Terminal Company, the Union Traction Company of Indiana, and the Fort Wayne & Northern Indiana Traction Company. Only the week before the W. S. Barstow & Co. interests announced the incorporation of a company to acquire a coal-operating property in West Virginia, the output to be available almost immediately for use by subsidiaries of the General Gas & Electric Company and the Eastern Power & Light Corporation at the contract price in effect last October. Few companies, however, are so organized that the alternative is possible of mining coal for themselves. The following suggestion for a possible way to obtain a measure of relief in the future was contained in the financial letter of the Philadelphia *Public Ledger* on April 28:

"Each day brings out further evidence of the difficulties under which the public utility companies are now operating. Reporting for March, the Northern Ohio Electric Corporation shows a gain of 33.54 per cent in gross earnings, but an increase of 70.10 per cent in operating expenses. Abnormally high prices for coal caused increases in expenses of $51,439 for the month, and for three months of this year the high cost of coal has added $193,017 to this company's costs. For March the Republic Railway & Light Company shows a gain of 14.17 per cent in gross, but an increase of 23.69 per cent in operating costs. Of the increased expenses, $26,338 went for coal at abnormally enlarged prices. The subject is rapidly crystallizing to a point where the public utility managers will have to get together and go before the various state commissions for relief. They may very properly use the argument that, if their companies are to be regulated as to rates, the fuel companies from which they buy should also be compelled to standardize fuel prices."

Standard Sizes of Catalogs

Technical Publicity Association, Which Includes Prominent Manufacturers in Its Membership, Adopted Four Sizes as Standard More Than Three Years Ago

In 1913 the Technical Publicity Association, through its standard size catalog committee, made a careful investigation of the various sizes of catalogs in use, and after considerable correspondence with paper manufacturers, with machinery and supply houses, and with a number of technical societies and associations, adopted 3½ in. x 6 in. for postal cards and envelop inclosures, 8 in. x 10½ in. for bulletins, and 6 in. x 9 in. and 8½ in. x 11 in. for catalogs. As the association includes many of the largest manufacturers in the electric railway industry, such as the General Electric Company, Westinghouse Electric & Manufacturing Company, Western Electric Company, H. W. Johns-Manville Company, Crouse-Hinds Company, the Texas Company, the Ingersoll-Rand Company, the C. W. Hunt Company, the Goldschmidt Thermit Company, the J. G. Brill Company, the Cutler-Hammer Manufacturing Company, and many others, it is interesting to note the progress made by these various firms in regard to following out the standards as prescribed by the T. P. A.

The J. G. Brill Company, through its publicity manager, S. M. Wilson, recently said: "It is undoubtedly very desirable to have all publications standardized for the convenience of those who must file large numbers for reference purposes, and we have endeavored to follow standard dimensions in all possible cases. The Brill magazine, which serves as a bulletin or running catalog of our products, as well as having a magazine character, has been 6 in. x 9 in. throughout the ten years of its existence. For the last year or two we have been issuing bulletins covering individual types of trucks, classes of cars, and special features. These are made 8 in. x 10½ in., which is the standard bulletin size, to enable them to be inserted in 8½-in. x 11-in. binders. As a member of the T. P. A. I voted for these standards, and can assure you that technical publicity managers everywhere are heartily in favor of them not only because of the convenience in filing by the users of such literature, but because they enable paper stock to be cut with less waste."

According to W. D. Lindsey, assistant advertising manager of the Western Electric Company, one exception to the standards of the T. P. A. has been employed. He said: "We have practically adopted for postal cards and envelop inclosures the size 3½ in. x 6 in., but when it comes to catalogs, we are compelled to adopt a size 6½ in. x 9½ in. for our annual book, because the size of our type page, of which we had a thousand or more in standing form, was 5½ in. x 8½ in.—in other words, too large to set on a leaf 6 in. x 9 in. In order to save the enormous expense of resetting all these pages, we chose the 6½-in. x 9½-in. size book. We want to follow the T. P. A. standards, but it so happened that we could not do it at that time, nor can we as yet, because pages set up since have been made to correspond with the old standard, namely, 5½ in. x 8½ in. for the printed matter."

H. M. Davis, manager of the advertising department of the Sprague Electric Works of the General Electric Company, says: "Our publications have been standardized to the following dimensions: Small envelop size, 3½ in. x 6 in.; large envelop size, 4 in. x 9 in., and bulletin size, 8 in. x 10½ in. When we publish an elaborate bulletin or catalog bound with a hang-over cover, the dimensions have exceeded by ¼ in to ½ in. the 8 in. x 10½ in. size."

Another company that deviates from the T. P. A. standards in one instance is the Cutler-Hammer Manufacturing Company. George J. Kirchgasser, its advertising manager, writes: "Some time ago the catalog covering our products was changed so that we now have what we call price and data bulletins which measure 4 in. x 7 in., and contain condensed information, while our descriptive literature is all in the 8½-in. x 11-in. size. The small folders that we use for envelop inclosure are usually 3⅝ in. x 6 in. We have had some trouble in supplying sheets to electrical supply jobbers because of the fact that the size of their catalog is about 8½ in. x 10 in."

C. W. Hunt Company, Inc., through George K. Jenckes of the advertising department, says: "Our standard catalog size for some time has been 6 in. x 9 in., and our postal cards and envelop inclosures 3¼ in. x 5½ in. We expect to use these sizes in all of our work wherever possible."

Lastly, Charles A. Hirschberg, publicity manager of the Ingersoll-Rand Company, who has recently been elected president of the T. P. A., says: "The writer has for some years subscribed to the resolution of the standard sizes for catalogs and advertising literature. All of this company's literature is in accordance with the T. P. A. standards."

Decrease in Exports for February

Exports of electrical goods were less in value in February than in any month since last July. The February exports amounted to $3,526,269, or about $1,400,000 less than in January. In comparison with February, 1916, however, there was an increase of $1,000,000.

For the eight months ended February, 1917, the exports of electrical goods totaled $31,744,237, in comparison with $18,151,223 for the corresponding period ended February, 1916, and $12,205,421 for that a year previous.

The total exports for the first two months of the current year amounted to $8,439,193, as compared with $5,163,433, for the first two months of 1916. Should the exports for the remainder of the year keep up at this rate, the 1917 figures will total over $50,000,000.

G. E. Appoints Sales Manager

J. R. Lovejoy, vice-president of the General Electric Company, has announced the appointment of John G. Barry as general sales manager of the company. Mr. Barry entered the employ of the company in the production department of the Thomson-Houston Company, at the Lynn Works. He then became connected with the Boston District office, and later was transferred to the general office in New York City. He went to Schenectady at the time the general offices were moved to that city. He has held the positions of assistant manager of the railway department, superintendent of construction, and manager of the railway department. Mr. Barry has been a resident of Schenectady for the past twenty years and his host of friends will be glad to learn of his advancement and increased responsibilities. Mr. Barry continues his present duties as manager of the railway department.

National Defense Committee Reports

Under date of April 30 the American Electric Railway Association's special committee on national defense issued a notice in which it said that the steam railroads of the United States had been ordered to give iron ore and coal preference over all other traffic. The committee explained that the reserve stocks of coal in many sections of the country had become depleted owing to an unprecedented consumption during the past year and it recognized the paramount need of the largest possible movement of coal to every part of the country during the coming warm months. The rule states that gondola and hopper cars when made empty must be sent loaded or emptied to or in the direction of the home road. Every movement of the car must be in the interest of apparent return to the home road; if necessary short-routing empty cars without charge.

NEW YORK METAL MARKET PRICES

	March 31	May 3
Prime Lake, cents per lb.	35	31
Electrolytic, cents per lb.	35½	31
Copper wire base, cents per lb.	42	36
Lead, cents per lb.	9½	9⅞
Nickel, cents per lb.	50	50
Spelter, cents per lb.	10¾	9½
Tin, Straits, cents per lb.	55⅞	58½
Aluminum, 98 to 99 per cent, cents per lb.	55	60

OLD METAL PRICES

	March 31	May 3
Heavy copper, cents per lb.	29	24½
Light copper, cents per lb.	24¾	21½
Red brass, cents per lb.	20	18½
Yellow brass, cents per lb.	19	17½
Lead, heavy, cents per lb.	8	7¾
Zinc, cents per lb.	8	7
Steel car axles, Chicago, per net ton	$38	$41.50
Iron car wheels, Chicago, per gross ton	$22	$24
Steel rail (scrap), Chicago, per gross ton	$27.50	$31.50
Steel rail (relaying), Chicago, per gross ton	$34	$39
Machine shop turnings, Chicago, per net ton	$9.50	$11.00

CURRENT PRICES FOR MATERIALS

	March 31	May 3
Rubber-covered wire base, New York, cents per lb.	42	36½
No. 0000 feeder cable (bare), New York, cents per lb.	42	36½
No. 0000 feeder cable stranded, New York, cents per lb.	39¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	39½	33
No. 6 copper wire (bare), New York, cents per lb.	42	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton	$38	$38
Wire nails, Pittsburgh, per 100 lb.	$3.20	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.65	$3.85
Steel bars, Pittsburgh, per 100 lb.	$3.75	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$4.85	$6.35
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$6.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	4.05	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.85	4.15
Cement (carload lots), New York, per bbl.	$2.02	$2.12
Cement (carload lots), Chicago, per bbl.	$2.06	$2.16
Cement (carload lots), Seattle, per bbl.	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.11	$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.02	$1.22
White lead (100 lb. keg), New York, cents per lb.	10¼	10¾
Turpentine (bbl. lots), New York, cents per gal.	45	52

ROLLING STOCK

Utah Light & Traction Company, Salt Lake City, Utah, is reported to be considering the purchase of cars.

Southern Pacific Company, San Francisco, Cal., is reported to have purchased six one-man cars for its San José lines.

Georgia Railway & Power Company, Atlanta, Ga., expects to build ten new pay-as-you-enter cars of the latest type. The estimated cost of these cars is $55,000.

Springfield Street Railway and the Worcester Consolidated Street Railway, Springfield, Mass., are reported to be in the market for twenty-two cars.

Twin State Gas & Electric Company, Brattleboro, Vt., has ordered three single-truck cars from the Wason Manufacturing Company.

United Gas & Electric Corporation, New York, N. Y., noted in the April 7 issue as being in the market for sixty-five cars, has placed an order with the J. G. Brill Company for thirty cars to be distributed as follows: Twelve, Knoxville; twelve, Little Rock, and six, Birmingham. An option for the purchase of the remaining thirty-five cars for the New Orleans properties was included in the agreement.

Interborough Rapid Transit Company, New York, N. Y., noted on page 766 of the April 21 issue of the ELECTRIC RAILWAY JOURNAL as giving the details of equipment of the 477 steel subway cars ordered from the Pullman Company, specified Westinghouse control equipments for all of these cars. This detail was in error, as the order was divided equally between the General Electric and the Westinghouse companies. The General Electric Company will furnish 238 equipments of Sprague-General Electric PC-10 multiple-unit control.

Oklahoma City (Okla.) Railway, noted in the April 21 issue as ordering ten single-truck cars from the American Car Company, has specified the following details for these cars:

Number of cars ordered	10
Type	Closed motor car
Seating capacity	32
Length over bumpers	32 ft. 4 in.
Length over vestibule	31 ft. 4 in.
Width over all	8 ft. 5 in.
Rail to trolley base	10 ft. 9¼ in.
Body	Semi-steel
Interior trim	Dark bronze finish
Headlining	Agasote
Roof	Arch
Axles	Brill
Bumpers	American Car—Channel iron
Car trimmings	Brill
Curtain fixtures	Curtain Supply
Curtain material	Pantasote
Door mechanism	Safety Car Devices Co., air operated
Paint	To be painted by railway
Hand brakes	Furnished and installed by railway
Headlights	Furnished and installed by railway
Journal boxes	Brill
Sanders	Brill Dumpit at diagonal corners
Sash fixtures	O. M. Edwards
Seats	12 Brill Winner reversible and 4 stationary
Seating material	Birch wood
Springs	Brill
Step treads	Feralun
Trucks, type	Brill 21-E
Ventilators	Six Brill exhaust per car
Wheels	33 in.

Puget Sound Traction, Light & Power Company, Bellingham, Wash., noted in the issue of March 24 as ordering ten light-weight cars from the St. Louis Car Company, has specified the following details for this equipment:

Number of cars ordered	10
Builder	St. Louis Car
Type	Light-Safety
Seating capacity	30
Weight (total)	13,000 lb.
Length over bumpers	27 ft. 9½ in.
Length over vestibule	26 ft. 9½ in.
Width over all	7 ft. 10 in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	Carline finish
Roof	Plain arch
Air brakes	Westinghouse
Car trimmings	St. Louis Car
Control	Type GE, K-10
Couplers	Bar type, St. Louis Car
Curtain fixtures	National Lock Washer
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Safety Car Devices Co. air operated
Fenders or wheelguards	H. B.
Hand brakes	Blackhall drop handle
Heaters	Peter Smith electric truss plank
Headlights	Golden Glow
Journal boxes	3 in. by 6 in. plain bearing
Motors	Two GE 258-A
Motors	Inside hung
Paint	Painted and varnished
Registers	International
Sanders	Nichols-Lintern
Sash fixtures	O. M. Edwards
Seats	St. Louis Car Co.'s lightweight stationary
Seating material	Rattan inserts
Step treads	Feralun
Retrievers	Ohio Brass
Trucks	St. Louis Car lightweight solid forged, single
Ventilators	Utility
Wheels	24 in. chilled iron

Northern Texas Traction Company, Fort Worth, Tex., has specified the following details for fifteen double-end pay-as-you-enter one-man safety motor cars, which are being built by the American Car Company:

Number of cars ordered	15
Type	One-man safety car
Seating capacity	34
Length over bumpers	27′ 9½″
Length over vestibule	26′ 9½″
Width over all	8′ 0″
Rail to trolley base	12′ 6″
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	None, rafter finish
Roof	Arch
Air brakes	Safety Car Devices Co.
Axles	Brill
Bumpers	American Car-channel iron
Car trimmings	Brill
Couplers	None—Pull bars used
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Safety Car Devices Co., air operated
Hand brakes	American Car with Pittsburgh ratchet drop handle
Headlights	Golden Glow S-M-95
Journal boxes	Brill
Sanders	Keystone air sanders
Sash fixtures	O. M. Edwards
Seats, style	Heywood Bros. & Wakefields 57-S-P
Seating material	Mahogany wood, steel and canvas-lined rattan
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trucks, type	Brill 78-M-1 Special
Ventilators	Utility
Wheels	24 in. diam., 2½ in. tread, ⅝ in. flange
Special devices	Faraday high voltage push button system

Tacoma Railway & Power Company, Tacoma, Wash., noted in the April 28 issue, page 809, as giving the details of equipment for twenty-eight single-end, one-man cars, specified American Car Company's door-operating mechanism instead of Safety Car Devices Company's air-operated mechanism.

TRADE NOTES

National Conduit & Cable Company, New York, N. Y., has changed the location of its Chicago office from 72 West Adams Street to the Rookery.

Charles M. Crofoot has been transferred from the post of district sales manager of the Cincinnati office to the New York City office of the Crouse-Hinds Company.

Atlantic Insulated Wire & Cable Company, New York, N. Y., announces the removal of its general sales office from 120 Liberty Street to the Vanderbilt Concourse, 52 Vanderbilt Avenue, New York City.

Verne W. Shear & Company, Akron, Ohio, sales engineers, have established a branch office in the Illuminating Building, Cleveland, Ohio, in charge of Bon J. Ballard, formerly with the H. W. Johns-Manville Company.

Safety Car Devices Company, St. Louis, Mo., has received an order for two sets of its air-brake and safety control equipment from the Massachusetts Consolidated Railways, Greenfield, Mass.

Railway Improvement Company, New York, N. Y., announce that its coasting recorders are being installed on all of the cars of the Houghton County Traction Company, Houghton, Mich., and the Cape Breton Electric Company, Ltd., Sydney (N. S.) Canada.

H. A. Howard, for many years connected with the C. & C. Electric Company, and until recently associated with the Diehl Manufacturing Company, has been appointed manager of the New England office of the C. & C. Electric & Manufacturing Company.

John C. Dolph Company, Newark, N. J., manufacturer of insulating varnishes, announces that the Dolph Manufacturing Corporation of 39 Cortlandt Street, New York City, has been appointed general sales representative of the company and all sales will be handled through this corporation hereafter.

Dr. W. F. M. Goss has resigned as dean of the College of Engineering, University of Illinois, to take up the duties of president of the Railway Car Manufacturers' Association. Temporarily he will be located at the office of the association, 1120 Frick Building, Pittsburgh, Pa.

C. H. Holden has been made central district manager for Edwards & Company, Inc., New York City, and has established a sales office at 9 Clinton Street, Chicago, Ill. Mr. Holden was formerly sales manager for the PR Manufacturing Company, and has had long experience in the sale of electrical specialties.

T. F. Webster, for twenty-five years associated with the Link-Belt Company and for the last twelve years manager of its Pittsburgh office, has resigned to become vice-president of the R. H. Beaumont Company, Philadelphia, builder of conveying and hoisting systems. Mr. Webster will be identified with the sales department.

Barron G. Collier, of Barron C. Collier, Inc., on behalf of the street car advertising operators, has offered to Secretary of the Treasury McAdoo the free use of one card in a campaign which will cover the whole United States. This offers an opportunity for the government to use without expense excellent advertising space in more than 35,000 cars throughout the country for the display of notices in regard to the sale of the new bonds or any other purpose desired by the government.

C. W. Forbrich, Western manager of the *Electrical Review and Western Electrician* since 1908, has resigned his position and formed the Forbrich-Burton Advertising Service, Inc., Monadnock Block, Chicago, Ill. J. H. Burton, who was formerly connected with the *Western Electrician*, has been in charge of the service department of *Practical Engineer* for the last few years.

Underwriters' Laboratories, New York, N. Y., announces that on May 1, 1917, the New York office and testing station of the Underwriters' Laboratories will be moved from 135 William Street and 92 Vandam Street to the twelfth floor of the Evening Mail Building at 25 City Hall Place, where increased space and the location of offices and laboratories in the same building will afford improved facilities for the conduct of its work.

ADVERTISING LITERATURE

National Lamp Works of the General Electric Company, Cleveland, Ohio, is distributing bulletin 28, descriptive of show window lighting.

Diamond Power Specialty Company, Detroit, Mich., has issued bulletin 125 on the application of its Diamond soot blowers to the boilers of the Babcock & Wilcox Company.

Westinghouse Church Kerr & Company, New York, N. Y., are distributing a bulletin, "Only a Week's Interruption by Fire," in which the ability of this organization to meet unexpected emergencies is illustrated.

Gold Car Heating & Lighting Company, New York, N. Y., is distributing a booklet on its thermostatic heat regulating systems. This method is described and a chart showing the even temperature obtained by its use is given.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has prepared leaflet No. 3978, descriptive of its type HB overhead relays. These relays are designed for use on high-voltage circuits, and are for indoor use, offering ample protection and sufficiently accurate time element for ordinary service.

American Steam Conveyor Corporation, Chicago, Ill., has issued a thirty-two page booklet giving a general description of American steam jet conveyors showing detailed views of the fittings used in this system, blueprints illustrating the system installed in different parts of power plants, and photographs of numerous central station and industrial plant installations of the system.

General Electric Company, Schenectady, N. Y., has issued bulletin 58329A on frame parts and grids for type IG resistors. It has also issued bulletin 44406A on GE-247 ventilated commutating pole railway motor. This 40-hp. motor is built in forms suitable for trucks with wheels 24 in. in diameter and is, therefore, well adapted both in characteristics and design for low-floor cars and for a considerable range in types of light and moderate-weight cars operating under all conditions of city service.

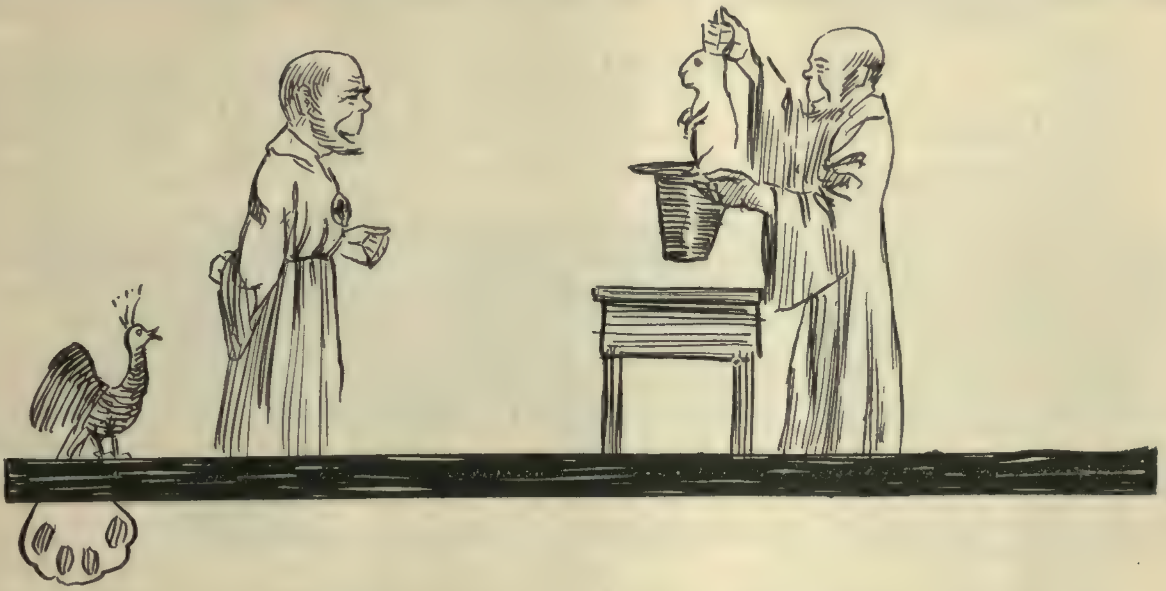
Electric Service Supplies Company, Philadelphia, Pa., has just issued a new and very comprehensive catalog on "Golden Glow" railway headlights and projectors. This catalog includes a complete line of dimming and main resistances, switches and other headlight accessories necessary for use in connection with railway headlights. This is a sixty-four-page book printed in two colors, and in producing it much effort has been expended in duplicating in appearance the different headlights. It was found particularly difficult to illustrate with printers' ink the "Golden Glow" reflector, which is of a greenish-yellow color.

Canton Culvert & Silo Company, Canton, Ohio, has recently issued a pamphlet containing abstracts from the company's files that indicate the popularity and adaptability of the company's nestable corrugated No-Co-Ro metal culverts. A feature of the pamphlet is a letter from the Union Traction Company of Indiana in which it is said that the results obtained with these culverts during three years of use indicate that deterioration is not likely to commence for many years. Another letter from the Kanawha Traction & Electric Company, Parkersburg, W. Va., states that culverts of this type installed during the summer of 1909 showed no signs of corrosion or failure in November, 1916.

New Publications

Government Telephones. By James Mavor. Moffat, Yard & Company, New York, N. Y. 176 pages. Cloth, $1 net.

In this book Mr. Mavor, who is professor of political economy in the University of Toronto, relates in detail the fatal weaknesses of government ownership as illustrated by the experience of the Province of Manitoba with telephones. The author charges that the management has been uneconomical, the enterprise handicapped by political intrigue, the finances unsoundly administered and the obligations of the public increased without adequate compensatory advantages. The book seems to be a careful attempt to uncover the facts of an interesting experiment, and as such is a valuable contribution to the general discussion on government ownership.



Guard Against Pishogues

It's recorded that the lucky owner of a four-leaved-shamrock can't be imposed upon by *pishogues* or spells.

Let's put a four-leaved-shamrock into your hand in the form of the Peacock Brake.

It's the best scarer-off of accident spells that we know of.

With the Peacock in your possession you can laugh foggy weather, heavy grades and slippery rails to scorn.

Join the jolly Peacock crowd!

National Brake Co.

Buffalo, N. Y.

Bankers and Engineers

Electric Railway Lighting and Power Company Bonds
ENTIRE ISSUES PURCHASED
THE NATIONAL CITY CO.
NATIONAL CITY BANK BUILDING
55 WALL STREET, NEW YORK

THE ARNOLD COMPANY
ENGINEERS—CONSTRUCTORS
ELECTRICAL—CIVIL—MECHANICAL
105 SOUTH LA SALLE STREET
CHICAGO
111 BROADWAY
NEW YORK

ALBERT S. RICHEY
ELECTRIC RAILWAY ENGINEER
WORCESTER POLYTECHNIC INSTITUTE
WORCESTER, MASSACHUSETTS

H. M. Byllesby & Company, Inc.
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Purchase, Finance, Construct and Operate Electric Light, Gas, Street Railway and Water Power Properties.
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Examinations and Reports
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CONSULTING AND CONSTRUCTING ENGINEERS
VALUATIONS AND FINANCIAL REPORTS, CONSTRUCTION AND MANAGEMENT OF ELECTRIC RAILWAYS
76 West Monroe St CHICAGO, ILL.

ELECTRICAL TESTING LABORATORIES
Electrical, Photometrical and Mechanical Testing.
80th Street and East End Ave., New York, N. Y.

THE J. G. WHITE COMPANIES
ENGINEERS CONTRACTORS
FINANCIERS OPERATORS
43 EXCHANGE PLACE . . . . NEW YORK
LONDON SAN FRANCISCO CHICAGO

Arthur D. Little, Inc.
An organization prepared to handle all work which calls for the application of chemistry to electric railway engineering—such as the testing of coal, lubricants, water, wire insulation, trolley wire, cable, timber preservatives, paints, bearing metals, etc.
Correspondence regarding our service is invited.
93 Broad Street, Boston, Mass.

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ROBERT W. HUNT & CO., Engineers
BUREAU OF INSPECTION TESTS & CONSULTATION
Inspection and Test of all Electrical Equipment
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PITTSBURGH, Monongahela Bk. Bldg.

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ENGINEERS
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Industrial Plants and Buildings, Steam Power Stations, Water Power Developments, Substations, Gas Plants, Transmission Lines, Electric and Steam Railroad Work.
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POWER STATIONS GAS WORKS
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Reports, Appraisals and Valuations, Railway and Lighting Properties

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SARGENT & LUNDY, Engineers
1412 Edison Bldg., 72 W. Adams St., Chicago, Ill.

"*Maintenance tells*"

Two-Ton G. V. Utility Truck

One man maintains 18
GENERAL VEHICLE
trucks for New Orleans

The New Orleans Railway and Light Company operates 18 storage battery trucks, all made by the General Vehicle Company:

1	750-lb. wagon for meter service
4	1000-lb. wagons for meter service
2	1000-lb. trucks for emergencies
6	2-ton line trucks (4 lighting, 2 railway)
4	2-ton trucks for rails, cement, etc.
1	3½-ton line truck
18	

One man only maintains this fleet of 18 electric vehicles.

The New Orleans Railway and Light Company maintains and charges all its electric vehicles at one station (530 Magazine St.). The batteries used are recharged nightly, they are never allowed to completely run out, and their average life is 18-22 months.

New Orleans is satisfied.

New Orleans bought its first electrics in 1911 and now doesn't want any other sort.

MAINTENANCE TELLS

GENERAL VEHICLE
COMPANY, INC.

General Office and Factory:
LONG ISLAND CITY, NEW YORK

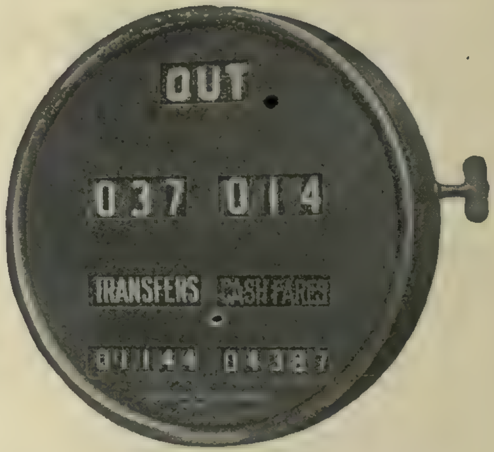
New York Chicago Boston Philadelphia

*If you are
in the market
for any kind of a*

Recorder

FARE COLLECTION SYSTEM

*Write us for
Catalog and
information*



Sterling No. 16

Dayton No. 101

We devote our entire time to the manufacture of a complete line of:

REGISTERING and NON-REGISTERING FARE BOXES

CASH and TICKET FARE BOXES

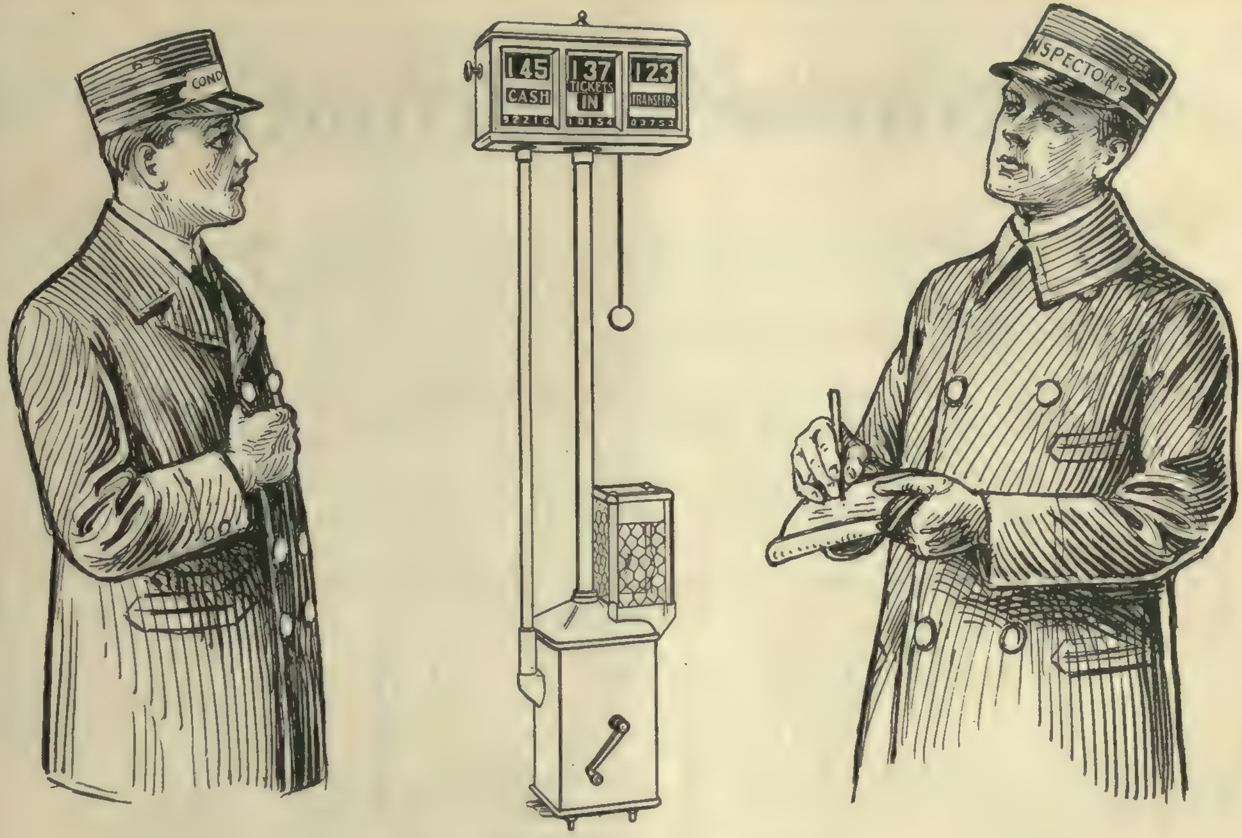
STERLING SINGLE and DOUBLE FARE REGISTERS

CLASSIFIED, INDICATING and PRINTING FARE RECORDERS

for city and suburban cars.

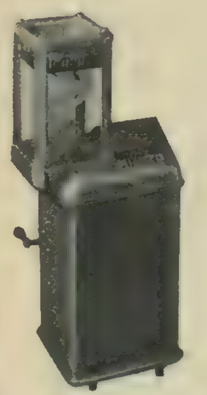
GUARANTEED PERFECT in design, material and construction, and UNEQUALED for accuracy, reliability, and low maintenance cost.

The Dayton Fare Recorder Co.
Dayton, Ohio, U. S. A.



Type C24 Coin, Metal Ticket and Transfer Register

Registration of Metal Tickets an INTERNATIONAL Success



Ticket Side
Type C17 Fare Box

The use of metal tickets or tokens is made thoroughly practicable by means of International Coin and Metal Ticket Registers and Fare Boxes.

They have made good mechanically and have demonstrated their effectiveness in increased earnings, safer and easier accounting and by facilitating traffic.

Knowing that fare collecting and registering mechanism must be subject to severe service and sometimes to abuse, these machines have been designed to meet severest conditions.

Let us demonstrate!

Money Side
Type C17 Fare Box

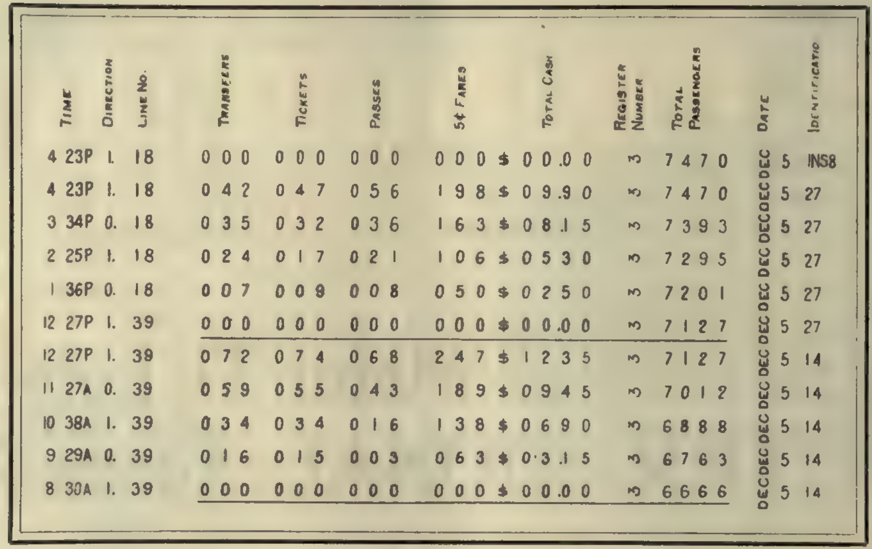
THE INTERNATIONAL REGISTER COMPANY

15 South Throop St., Chicago

Accurate Information

Accurate information is a fundamental requirement in any business. The money earned, as well as the money spent, must be carefully itemized.

Each fare collected in your cars must be separately indicated, classified, and an unalterable record made at the time and at the place the transaction occurs, **or you are not building on solid ground.**



Time	Direction	Line No.	Transfers	Tickets	Passes	5¢ Fares	Total Cash	Register Number	Total Passengers	Date	Identificatio
4 23P	I.	18	000	000	000	000	$ 00.00	3	7470	DEC 5	INS8
4 23P	I.	18	042	047	056	198	$ 09.90	3	7470	DEC 5	27
3 34P	O.	18	035	032	036	163	$ 08.15	3	7393	DEC 5	27
2 25P	I.	18	024	017	021	106	$ 0530	3	7295	DEC 5	27
1 36P	O.	18	007	009	008	050	$ 0250	3	7201	DEC 5	27
12 27P	I.	39	000	000	000	000	$ 00.00	3	7127	DEC 5	27
12 27P	I.	39	072	074	068	247	$ 1235	3	7127	DEC 5	14
11 27A	O.	39	059	055	043	189	$ 0945	3	7012	DEC 5	14
10 38A	I.	39	034	034	016	138	$ 0690	3	6888	DEC 5	14
9 29A	O.	39	016	015	003	063	$ 0·3.15	3	6763	DEC 5	14
8 30A	I.	39	000	000	000	000	$ 00.00	3	6666	DEC 5	14

A Record from a No. 39 Type Ohmer Fare Register

The **Ohmer System** provides complete, printed records of every detail of business done. These records are so clear and compact that the itemized information is at once available for statistical purposes, and by a quick method of analysis, which is a part of the Ohmer System, the characteristic tendencies of each conductor are so revealed that thoroughly effective discipline, based on absolute knowledge of the facts, can be applied.

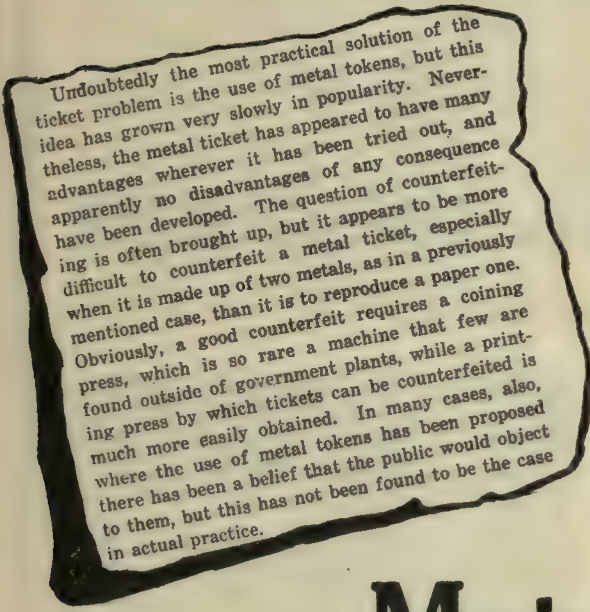
The Ohmer System not only furnishes accurate and complete records, but it also enforces honest service in the only practical way, **by making it worth while** for the conductors to be honest and efficient.

Give us an opportunity to tell you just what the Ohmer System really is. You will be interested because it deals with vital facts.

Ohmer Fare Register Company

Dayton, Ohio

"Undoubtedly the Most Practical"



Undoubtedly the most practical solution of the ticket problem is the use of metal tokens, but this idea has grown very slowly in popularity. Nevertheless, the metal ticket has appeared to have many advantages wherever it has been tried out, and apparently no disadvantages of any consequence have been developed. The question of counterfeiting is often brought up, but it appears to be more difficult to counterfeit a metal ticket, especially when it is made up of two metals, as in a previously mentioned case, than it is to reproduce a paper one. Obviously, a good counterfeit requires a coining press, which is so rare a machine that few are found outside of government plants, while a printing press by which tickets can be counterfeited is much more easily obtained. In many cases, also, where the use of metal tokens has been proposed there has been a belief that the public would object to them, but this has not been found to be the case in actual practice.

That's what the 1916 Convention Number of Electric Railway Journal says about the metal tickets. This is an unbiased statement by an authority in the chapter on fare boxes and fare collection problems of the issue referred to.

Read it for yourself. It will also pay you to **study the experience** of the Public Utilities Company of Evansville, Ind., published in interesting detail in the April 7th, 1917, issue of the Journal.

Metal Tickets and Johnson Fare Boxes

have been ordered for the city properties of **Public Utilities Company, Evansville, Ind.; Mobile Light & Railway Company, Mobile, Ala.; Denver Tramway Company, Denver, Colo.; United Railways Company of St. Louis, St. Louis, Mo.; Milwaukee Electric Railway & Light Company, Racine, Wisconsin.**

The advantages of adopting the Johnson system of metal ticket fare collection are many. There are no disadvantages. It eliminates possibility of substituting tickets and assures proper registration of all fares collected.

The Johnson Box has been *tested in the crucible of experience*—strenuous, exacting, practical railway experience—and found worthy. Its superiority in scope of service, in mechanical efficiency, durability and low cost of upkeep, is well established. For many months, 80% of all fare box orders have been *Johnsons.*

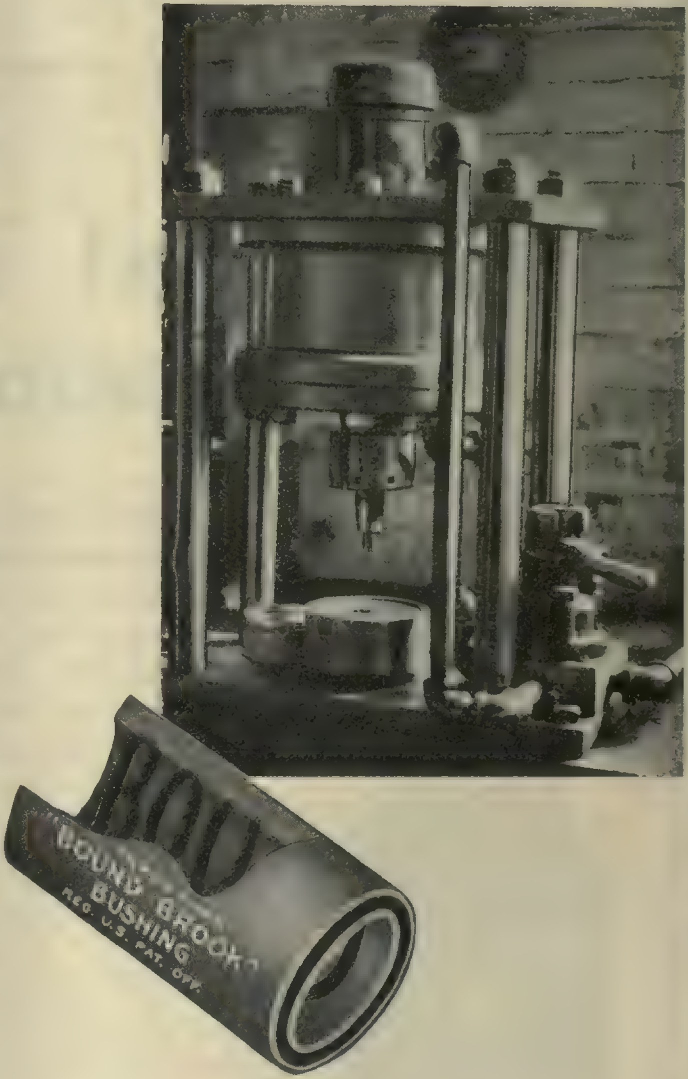
When *you* are ready to discuss the complete and final solution of your fare collection and accounting problem, *we* are.

JOHNSON FARE BOX CO.

Jackson Boulevard and Robey St., Chicago
50 East 42nd Street, New York

Get the Best Results
from the Best Bushings
by installing them the
"Boston Pneumatic" Way

5 Bound Brook Bushings
per minute



is the speed they're making—in bushing trolley wheels at the shops of the Boston Elevated Railway.

The trolley wheels are held firmly under a pneumatic press which forces Bound Brook trolley wheel life—insuring bushings into the hub.

That means just 2.77 cents labor cost per wheel—to be exact.

You don't know what good trolley wheel lubrication is until you've used Bound Brook Bushings.

The Boston Elevated installs over 10,000 per year.

All genuine "Oil-less Bearings" have always been made at Bound Brook, N. J., in the United States of America, by the

Bound Brook Oil-less Bearing Co.
formerly **Graphite Lubricating Co.**

55 Ton High Speed Interurban Car

The Lesson of Experience

The
Wonderful
Single Service
Chilled Iron
Wheel

The experience of last year, the experience of the year before and the experience of every one of the last 67 years has demonstrated that the Chilled Iron Wheel performs the greatest and most economical service on the rail.

95% of all the wheels in use in Steam Railways of the United States and Canada and 90% of all the wheels in use on Electric Railways of the United States and Canada operating 100 cars or more are Chilled Iron Wheels.

The reasons are:

1st: Chilled Iron Wheels will give a large mileage per unit of wheel cost.

2nd: Chilled Iron Wheels, because of their low initial investment, have the advantage in interest charges and expensive lathes are not required for re-turning.

3rd: Chilled Iron Wheels cause less wear and tear on the track, less brakeshoe consumption and less power is required.

25,000,000 now running.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS
1228 McCormick Building, Chicago, Ill.

Representing Forty-eight Wheel Foundries Throughout the United
States and Canada. Capacity 20,000 Chilled Iron Wheels Per Day

NEWARK

63

officials

of the Public Service Railway Company of Newark are Electric Railway Journal subscribers.

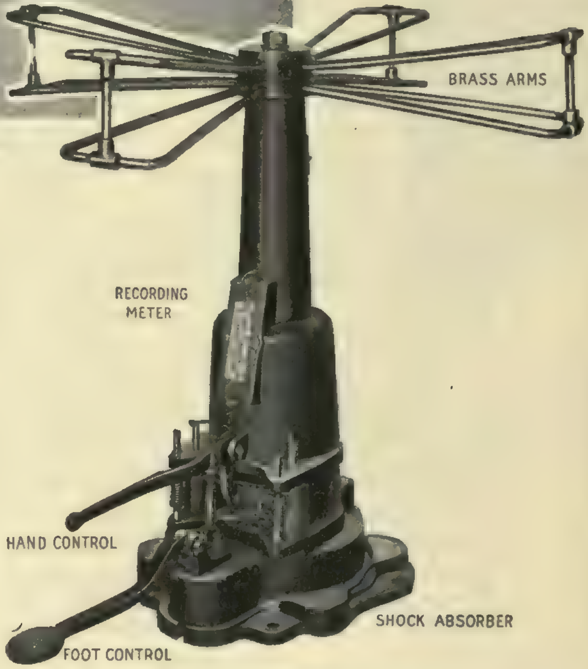
These men influence, either directly or otherwise, the purchase of an enormous amount of electric railway equipment and material for the operation of more than 2050 cars on 835 miles of track. Both executive and operating heads in ALL departments read the Electric Railway Journal. For instance, the transportation executives alone take 20 copies.

Manufacturers can talk to these men effectively, and to thousands like them on other roads, through the advertising pages of

Electric Railway Journal

Member Audit Bureau of Circulations

New York



PEREY
TURNSTILES

are now replacing ticket selling at the new Newark Terminal of the Public Service Railway

This change has been made necessary by the fact that traffic at this point has doubled within the past few months, and in view of a further increase during the summer rush.

Efficient patriotism is the keynote of the government messages to the industries of the country.

Be patriotic *efficiently*—women will handle the traffic as well as men with the Perey Turnstile.

This should be of interest to you NOW when men are liable to be drafted into the country's service.

Perey Equipment is used wherever fare collection is efficiently handled.

PEREY MANUFACTURING CO., Inc.

30 Church Street New York City

Practical advice in the shop is trouble saved on the road

That is one of the many benefits secured through our free Expert Service. Read the following partial report from one of our Experts:

"The manager understands of course that if the bearings are in poor condition, even the best oil will not prevent trouble, but he is greatly perturbed by the hot boxes on their interurban cars. I have made *suggestions* to obviate this and bring about permanent betterments to the service, as follows:

"First—The work of rebabbitting journal brasses should be done at the main shop and by one man, so as to place the blame for poor work that is being done.

"Second—That a more liberal supply of new brasses be placed in service, as there are a number of the old ones that must be scrapped.

"Third—That as soon as possible rebabbitting of journal brasses be discontinued and the brass be allowed to wear to a scrapping point and then taken out of service.

"Fourth—On account of the high speed and weight of cars, there should be a more liberal renewal of high grade packing, as a large proportion of the journal packing now in service is short strands, and while it would prove satisfactory in slower service, it is not conducive to good operation under the present conditions.

"Also, I have *requested* them to discontinue a practice which, no doubt, has been the cause of a part of the journal trouble, and if continued it will ruin the journals. I refer to a block of wood that has been made in the form of a journal brass and when they have a hot journal they remove the brass and put in the block of wood with a sheet of emery cloth on its face and then run the car. The result is another hot journal, as it is impossible to remove all the emery from the journal without removing the journal box. Furthermore, any irregularity in the journal face or diameter will be aggravated by such a proceeding and new journal brasses will have so little surface in contact with the journal that the weight per square inch is out of all proportion to what it should be. This was proven by an inspection of journal brasses that had only been in service twenty-four hours. The journal box dust guards have not had the attention they deserve, and there are a number of journals without them."

Little things? Yes. But it was the viewpoint of a practical outside man that discovered them and realized their important effect on good service. That is what our Experts will do for you—point out the little faults, far reaching in their unfavorable effect on your service, that you have lived so close to that they have been unnoticed. And note that our man made only SUGGESTIONS and REQUESTS of the railway officials—no commands, no arbitrary demand that such and such a thing be done—it is up to the officials to accept or reject our recommendations. But the wide-awake railroad man is looking for practical advice. And we are equipped to give it to him.

Galena-Signal Oil Co.

Franklin, Pa.

The First Book to Cover Broadly the Whole Field of Rate-Making

To the consulting engineer, to the company official—to any man at all interested in the problems of rate-making, this book possesses exceptional interest and value.

Just Issued

Public Utility Rates

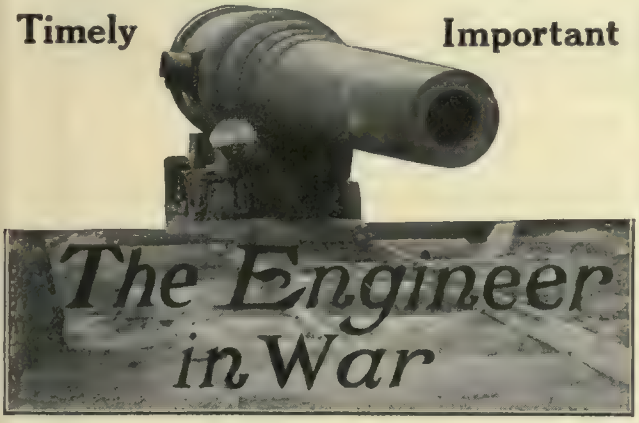
By **Harry Barker,** Associate Editor, Engineering News-Record, Member A.I.E.E. 387 pages, 6x9, $4.00 net, postpaid.

This book covers fully yet clearly and concisely the whole question of rate-making.

The material it contains can be grouped into three main divisions—a comprehensive discussion of

(1) Such corporation and municipal activities as affect service and rates;
(2) The trend of public opinion and court and commission decisions; and
(3) The most important engineering and economic problems involved.

Timely **Important**



By P. S. Bond

Major, Corps of Engineers, U. S. Army, Member Am. Soc. C. E., Honor Graduate Army Field Engineer School, Graduate Army Staff College.

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This treatise is based on the author's careful study of the whole subject, extending over a number of years, and contains a digest of the great wealth of material to which he had access. Every effort has been made to produce a book free from the mass of obscuring detail which necessarily marks individual cases.

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Collier Car Cards

Often Cost Hundreds of Dollars Each

Like any other form of advertising, car cards pull business in proportion to their attractiveness and variety. A car card must consist of something more than white paper and black ink.

Collier Service includes a large number of artists, engravers and writers whose sole duty is to devise telling pictures and text in every color and style.

No local agency could afford to give such value to the advertiser. Collier Service can and does give such value only because and so long as the overhead expense can be divided among thousands of cars.

Barron G. Collier INCORPORATED

Candler Building
220 West 42nd Street, New York City

A new type of gear and pinion especially prepared and heat-treated, made from a material of fine quality steel blanks, both split, and sold at an exceptionally reasonable price.

Armorized, Star Brand

Catskill

Gears and Pinions

are cut true to pitch, and then put through the special heat-treating process which gives them exceptional tensile strength and assures a wearing ability of from 3 to 5 times greater than that of ordinary gears and pinions.

Where heavy service is an absolute essential, specify Catskill Gears and Pinions.

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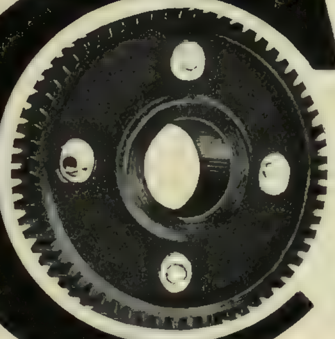
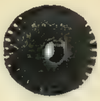
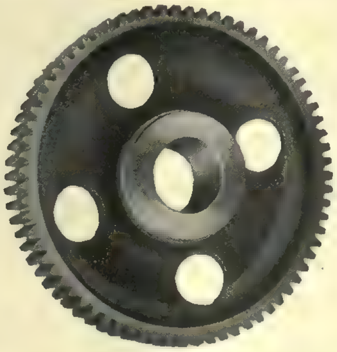






W. R. Kerschner Co., Inc.

50 Church Street, New York

Columbia Tools on the Job for You!

Turning out Bearings

You will understand the perfection of Columbia-made products when we tell you that we have several hundred machine tools alone.

Practically each tool, be it drill, shaper, borer, grinder, plainer or lathe, is handled by the same man day in, day out.

Such specification inevitably results in turning out the best possible work.

That's only one of many reasons for using Columbia-made products.

TOOLS

- Armature and Axle Straighteners
- Armature shaft straighteners
- Armature buggies and stands
- Babbitting molds
- Banding and heading machines
- Car hoists
- Car replacers
- Coil taping machines for armature leads
- Coil winding machines
- Pinion pullers
- Pit jacks
- Signal or target switches
- Tension stands

CAR EQUIPMENT

- Armature and Axle Bearings
- Armature and field coils
- Bearings (Axle and Armature)
- Brush-holders and brush-holder springs
- Brake, door and other handles
- Brake forgings, riggings, etc.
- Car trimmings
- Commutators
- Controller handles
- Forgings of all kinds
- Gear cases (steel or mall. iron)
- Grid resistors
- Third-rail shoe beams and accessories
- Trolley poles (steel) and wheels

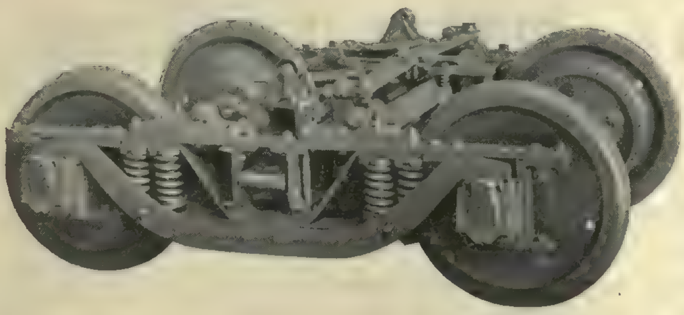
Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St., Brooklyn, N. Y.

W. R. Kerschner Co., Inc., N. Y. Holden & White, Inc., Chicago F. F. Bodler, San Francisco

Truck Equalization

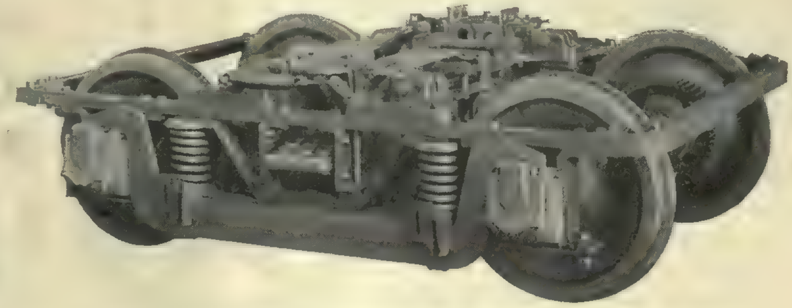
If railway tracks were perfectly surfaced there would be no need for equalized trucks; but even on the best roads there are low joints and other imperfections which cause rough riding and consequent discomfort to passengers. Hence the importance of designing the trucks so that jolts and jars due to uneven spots in the track will be absorbed before they are transmitted to the car body.



Suburban Truck, Class 73-22-K, for Fort Wayne & Springfield Ry. Co.

In the equalized truck, each wheel carries an equal portion of the load and keeps its bearing on the rail in spite of inequalities in the track surface. The truck frame is rigid, but is spring supported on beams which rest on the journal boxes. These boxes, and consequently the axles and wheels, can move vertically with reference to the frame, and thus follow inequalities in the track without imparting such movement to the car body.

As a general proposition, all trucks should be equalized. It pays, because of reduced wear and tear on track and equipment, and increased comfort for the passengers.



High Speed Interurban Truck, Class 84-30-AA, for Chicago, North Shore & Milwaukee R. R.

Baldwin truck engineers have made a special study of equalized truck design and construction, and you are invited to avail yourself of the results of their work. Two equalized truck designs are illustrated on this page.

THE BALDWIN LOCOMOTIVE WORKS

Philadelphia, Pa.

REPRESENTED BY

F. W. Weston, 120 Broadway, New York, N. Y.
Charles Riddell, 627 Railway Exchange, Chicago, Ill.
C. H. Peterson, 1210 Boatmen's Bank Bldg., St. Louis, Mo.
George F. Jones, 407 Travelers' Building, Richmond, Va.
A. Wm. Hinger, 512 Northwestern Bank Bldg., Portland, Ore.
Williams, Dimond & Co., 310 Sansome St., San Francisco, Cal.

RELIABILITY - PERMANENCE - ECONOMY.

OKONITE

TRADE MARK
REG. U. S. PATENT OFFICE.

The STANDARD for RUBBER INSULATION

Railway Feed Wires insulated with OKONITE are unequaled for flexibility, durability, and efficiency, and are in use by the leading Electric Street Railway Companies. OKONITE is preferred above any other insulation for Car Wiring, Telegraph and Telephone Purposes.

OKONITE WIRES—OKONITE TAPE
MANSON TAPE—CANDEE WEATHERPROOF WIRES
CANDEE PATENTED POTHEADS

Samples and Estimates on Application

THE OKONITE COMPANY, 501 Fifth Ave., cor. 42nd St., New York

CENTRAL ELECTRIC CO., Chicago, Ill., General Western Agents

F. D. Lawrence Electric Co., Cincinnati, O. **Novelty Electric Co., Philadelphia, Pa.** **Pettingell-Andrews Co., Boston, Mass.**

TROLLEY WIRE

Round Grooved and Figure 8

If you will agree that one make of trolley wire is able to give longer service than another make—

That one is more economical than another—

Then investigate our trolley wire with a view to cutting your wire costs.

STAR BRAND
Made to Wear To Wear Well
WEATHER-PROOF WIRE

Weatherproof Wires and Cables

Star Brand

Star Brand Wires are made with long service as the most prominent feature.

Because of their ability to render long service they cut wire costs.

Read the words in the cut of the star.

American Electrical Works

Phillipsdale, R. I.

NEW YORK: 165 Broadway
CHICAGO: 112 West Adams Street
BOSTON: 176 Federal Street

CINCINNATI: Traction Building
SAN FRANCISCO: 612 Howard Street
SEATTLE: 1002 First Avenue South

3105

Patented

Ask for Prices

You Can See Why

this trolley hanger gives such universal satisfaction.

A glance at this assembled view will show you why it is so easy to adjust and align.

The sample of the

WHITE Porcelain Trolley Hanger

which we will be glad to send to you will convince you that materials are of the highest quality—that the porcelain insulator is not subject to the deterioration that leads to the dangers of short circuit—that the sherardized yoke will withstand the action of the elements.

The stud is a standard stud, but can be furnished in bronze.

Let us quote you on complete hangers or parts.

Immediate Shipment from Stock.

T. C. White Electrical Supply Co.

1122 Pine Street, St. Louis, Mo.

Foreign Representatives: Forest City Electrical Service Supply Co., Salford, England.

SAFETY FIRST

ECONOMY renewable cartridge FUSES

Protect Cars and Power-plant

Don't trust to your more limited facilities for refilling fuses. As fuse specialists, we furnish reliable and carefully ***tested Renewal Links*** all ready to insert in

ECONOMY renewable cartridge FUSES

when they blow. These Links cost but a trifle and assure a complete break in the circuit at the required overload.

There's no need to use an extra new fuse every time one blows when the ***efficient and safe*** Economy fuse can be renewed over and over again with our ***tested*** Renewal Links at a saving of 80% of fuse maintenance expense under old-style, wasteful methods

Write now for Bulletin No. 17 and our catalog.

Economy Fuse & Mfg. Co.

Kinzie and Orleans St.
Chicago, Ill.

You Can Minimize Overhead Repair Work

and successfully cut maintenance costs if you turn to

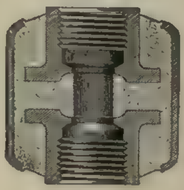
The Macallen Line

of strain insulators, hangers, splicing ears, crossings, and other overhead material.

They are "specialty" products, designed and built to make "Macallen" the standard on American railways.

It will pay you to write for information and prices.

The Macallen Insulating Joint



Adopted by principal air brake manufacturers as part of their standard equipment. Also insulates steam pipes, etc. Shell is seamless drawn steel, nipples are machined from steel rod, and insulating material is Macallen Vulcanite Compound, not affected by heat or oil—practically indestructible.

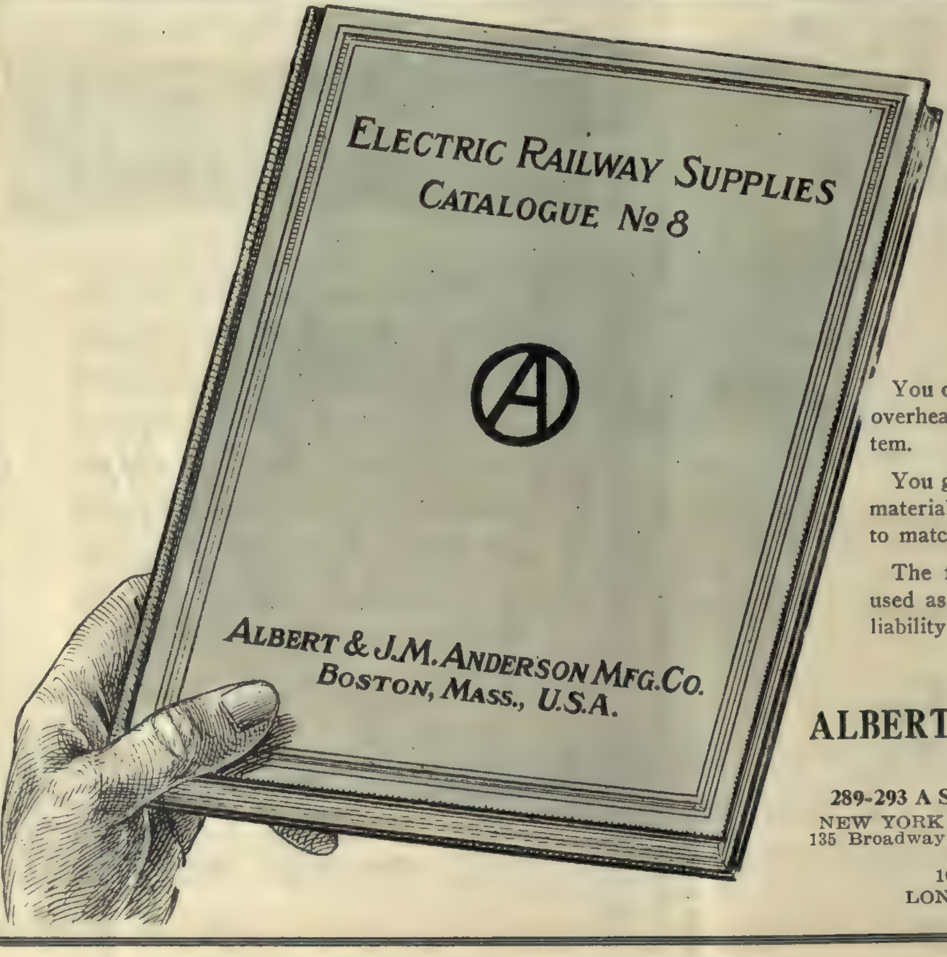
May We Send Our Catalog?

TRADE MACALLEN MARK

The Macallen Company

Macallen and Foundry Sts., Boston

TRADE MACALLEN MARK



Not a Mere Catalog —But a Service!

You can use it to figure the cost of the overhead line material for an entire system.

You get weights, cost and character of material—with a richness of detail hard to match elsewhere.

The fact that Anderson products are used as a basis insures the greatest reliability to the data.

Write for a copy.

ALBERT & J. M. ANDERSON MFG. Co.

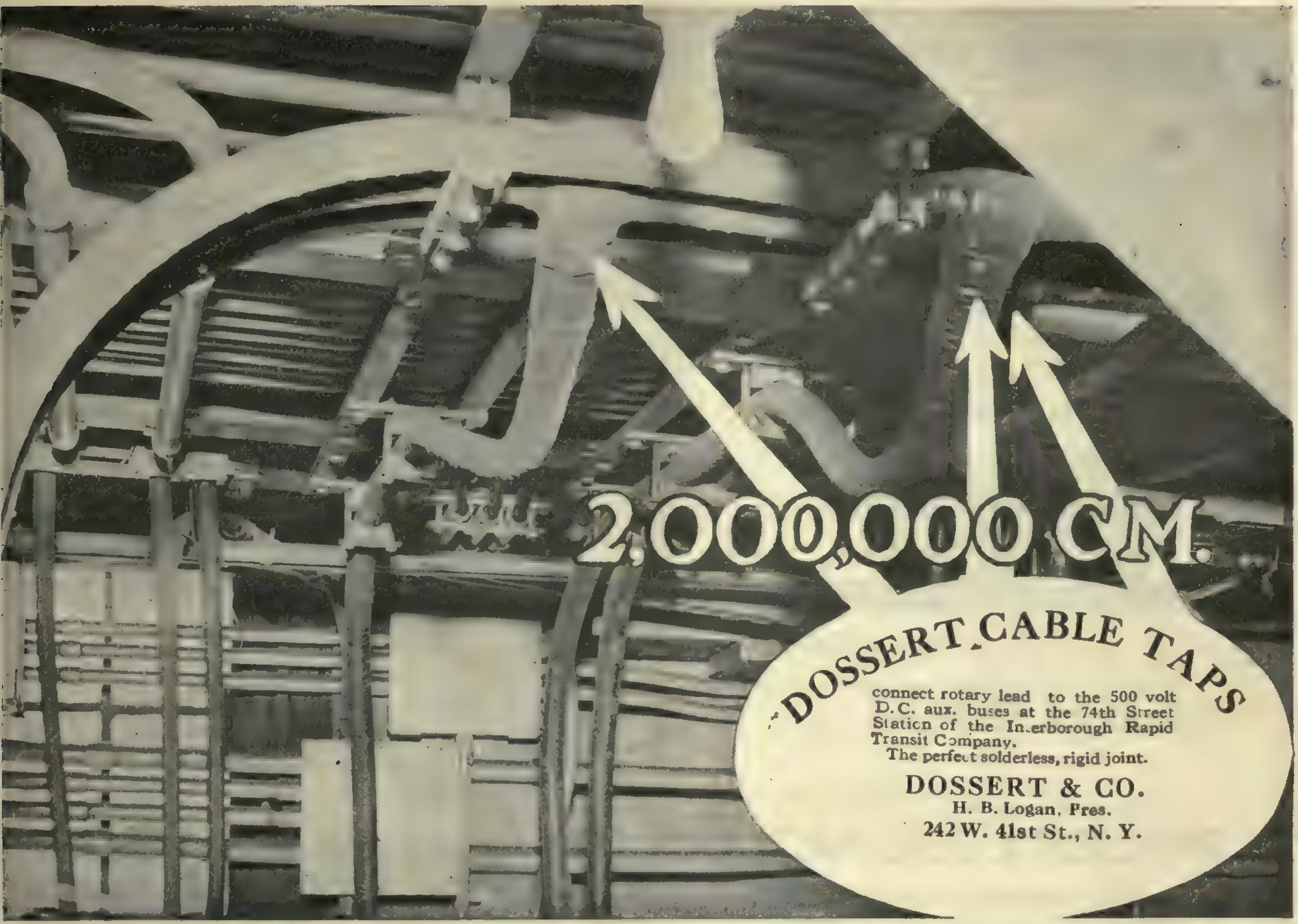
289-293 A Street, Boston, Mass., U. S. A.

NEW YORK
135 Broadway

PHILADELPHIA
429 Real Estate Trust Bldg.

CHICAGO
105 S. Dearborn St.

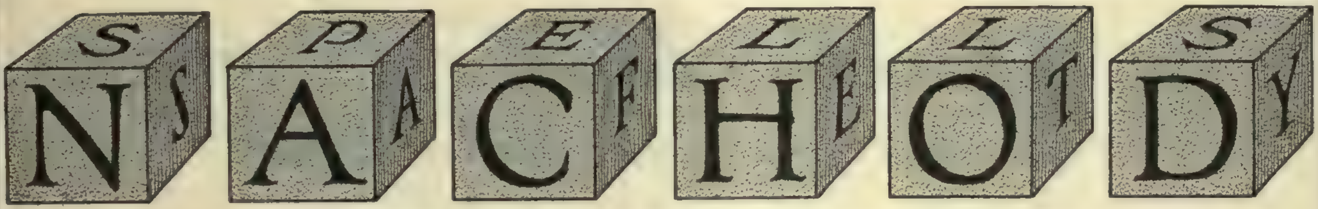
LONDON, E. C., 48 Milton St.



DOSSERT CABLE TAPS

connect rotary lead to the 500 volt D.C. aux. buses at the 74th Street Station of the Interborough Rapid Transit Company.
The perfect solderless, rigid joint.

DOSSERT & CO.
H. B. Logan, Pres.
242 W. 41st St., N. Y.


N A C H O D
S P E L L S
S A F E T Y

NACHOD SIGNALS give high protection at a small ultimate cost. Made for single-track opposing movements, absolute or permissive, and for double-track following movements.

NACHOD CROSSING BELLS warn the public of danger from approaching cars, and advertise to the public progressive railway operation.

NACHOD HEADWAY RECORDERS give an accurate record at the end of the day of the entire car operation at a given point.

Better write us for details. For safety's sake—do it now

NACHOD SIGNAL COMPANY, INC., 4773 Louisville Avenue, LOUISVILLE, KY.

Pacific Coast Representatives: Eccles & Smith Co.
46-48 Front St., Portland, Oregon 69-71 First St., San Francisco, Cal. 241 S. Los Angeles St., Los Angeles, Cal.

FIRST SELF-TIGHTING LOCK NUT

ROLLER LOCK NUT CO. N.Y.
Part of Steel Cover Removed

"Don't Delay Longer!"
USE a Roller
on
Cars and Tracks

This nut will cut labor costs in half. It will increase life of cars, crossings, frogs and insulated joints.

It is used alone and is installed and removed just like a plain nut.

It can be reused many times without injury to bolt threads.

Fool proof and wear proof.

ROLLER LOCK NUT CO., 61 Broadway, New York

The Lincoln Bonding System

Uses Energy for the Shortest Period

The Lincoln Bonding System, embodying the use of a motor-generator set and positive polarity for the rail—

Requires about one-third the amperage as a brazing process.

But for as Little as One-Fifth the Time

The Lincoln Bonding System is therefore not only the most economical in the use of energy, but also the quickest, as a bond can be applied in 40 seconds, so that car service is not impeded.

Lincoln outfits equipped with an extra control panel are just as efficient for miscellaneous shop welding and repairs as for bonding.

A true Integral Weld made in the shortest time at minimum cost and without resistance losses

The Lincoln Bonding Co.
636 Huron Road, Cleveland, Ohio

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CHARLES N. WOOD CO.
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HOLDEN & WHITE, Inc.
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808 First National Bank Building

Your commutators reflect the performance of your brushes

If you use

DIXON'S

Graphite Brushes

their perfect service will be reflected in the polished smooth surface they will produce on the commutators of your generators and rotaries.

Dixon brushes are non-scratching—they're self-lubricating; it's impossible for them to score commutators.

And they're eminently suitable for railway station service because graphite brushes adapt themselves peculiarly well to high voltage work.

Let us send you prices on your particular type.

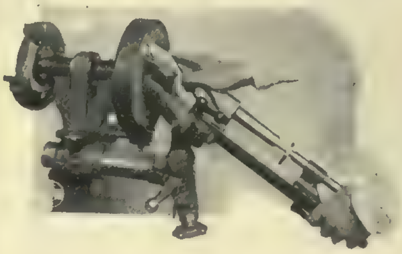
Address Department 108-M.

Made in JERSEY CITY, N. J., by the

Joseph Dixon Crucible Company

Established 1827

Wheels for Grinding Twist Drills



The wheels regularly furnished by Norton Company for various twist drill grinding machines are:

American Drill Grinding Machines—Alundum vitrified, 46-L.

Sellers Grinding Machines—Alundum silicate, 46-M and elastic, 36-4.

New Yankee Grinding Machines—Alundum vitrified, 46-K, L and M.

Worcester Twist Drill Grinding Machines—Alundum vitrified, 46-L.

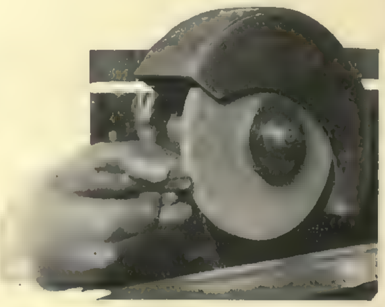
While wheels that are successful on high-speed steels will usually work satisfactorily on carbon steels, it has been demonstrated that the very best wheel for carbon steel may be far from satisfactory on high-speed steel.

A twist drill ground for steel may catch and "hog in" on brass, especially at the back of the hole where it breaks through. To prevent this, grind the lead or rake from the cutting edge.

Norton Company
Worcester, Mass.

New York Store
151 Chambers St.

Chicago Store
11 N. Jefferson St.



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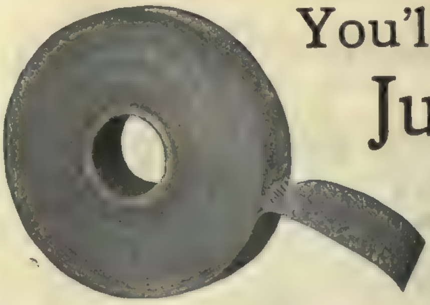


You'll find

Just the right consistency

in our

TAPES

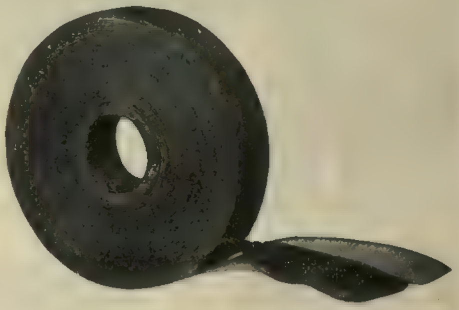
You won't get any peeling splices.

Our Friction Tapes have high adhesive qualities and strong fabric.

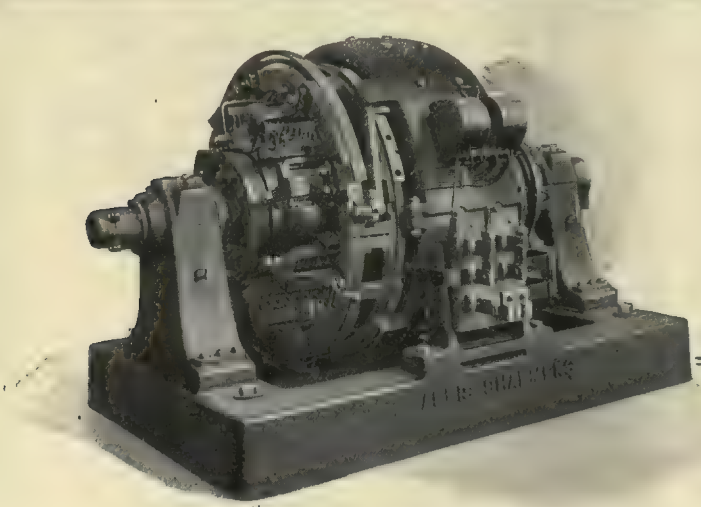
Our Rubber Tapes are elastic and high in insulating qualities.

All our tapes, both rubber and friction are put through all the tape tests. The pin-hole test, test for strength, test for elasticity, test for homogeneousness, test for uniformity.

We make fifteen different brands of tape. See which ones fit your needs.



The Mechanical Rubber Co. Cleveland, Ohio



Rotaries

For Railway Service

Allis-Chalmers

Synchronous Converters or Rotaries

Incorporating all Features of the Latest and Best Engineering Practice

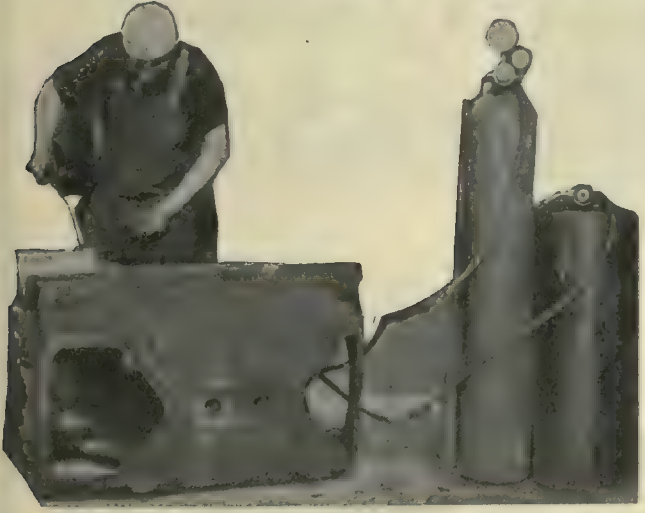
Any Capacity *2, 3 or 6 Phase*
For 60 or 25 Cycle Systems
Any Standard Voltage Up to 1500 Volts

Allis-Chalmers Manufacturing Company
Milwaukee, Wisconsin
Offices in All Principal Cities
Canadian Representatives: Canadian Allis-Chalmers, Ltd., Toronto, Ont.

Specifications
See Illustration

Rating:
750 k.w., 650 volts, 900 r.p.m., 6 phase, 60 cycles.
Self-Starting from A.C. Side.
Commutating Poles
Auxiliaries:
Speed Limit Device.
Mechanical Shaft Oscillator.
Brush Lifting Device.
Field Break-Up Switch.
Temperature Guarantees and Tests:
In accordance with latest A. I. E. E. Standardization Rules.

Dodging the Scrap Pile



by means of

OXWELDING

Many street railways are cutting down maintenance expense tremendously. Broken or worn car and machine parts, formerly junked, now come back into service—good as new—quickly and cheaply.

In some cases, even, new parts are being cut out of scrap steel plate. And around the shop and out on the line, in emergencies, Oxweld portable equipment frequently proves itself "worth its weight in gold."

OXWELD UNIVERSAL SERVICE

is the big, distinctive thing that you'll appreciate most. It places at your disposal the accumulated experience of not only the biggest street railways, but of other industries all over the country as well. It takes up its work right where most "service" stops—after the sale. Oxweld users have at their command an Advisory, Inspection and Repair Service which is absolutely unique.

You see, we've taken a leaf from the Public Utility Company's policy—we're making Good Will as fast as we're making good customers.

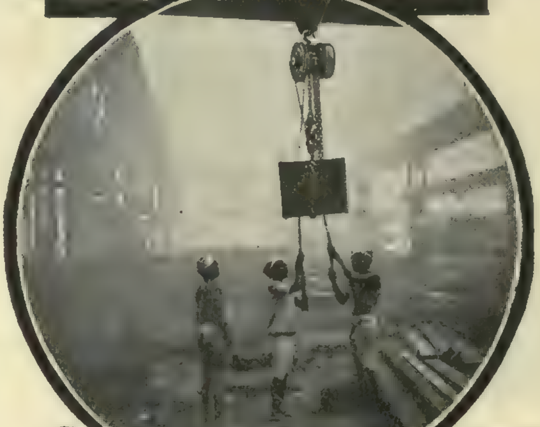
You ought to have Bulletin Series 700-R. You ought to know the practical reasons why

OXWELD APPARATUS
WORKS FASTEST, CHEAPEST
AND MOST EFFICIENTLY.

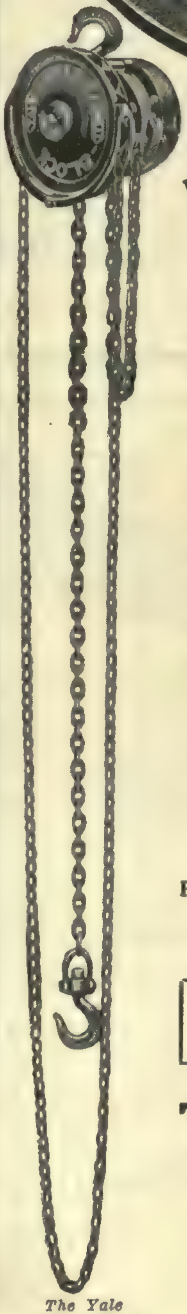
Oxweld Acetylene Co.
NEWARK, N. J. CHICAGO LOS ANGELES

America's Largest Makers of Welding and Cutting Apparatus and Supplies.

YALE



Yale Hoists handling ship material in India



The Yale Triplex Block

Yale Hoists
What "Yale" Means

Each part of the Yale Triplex Block is made with a complete knowledge of chain block needs and manufacture from the beginning of the industry.

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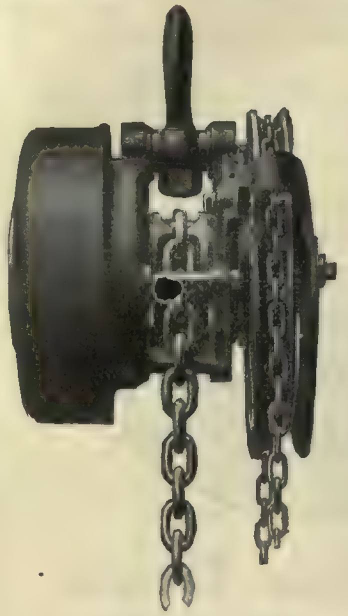

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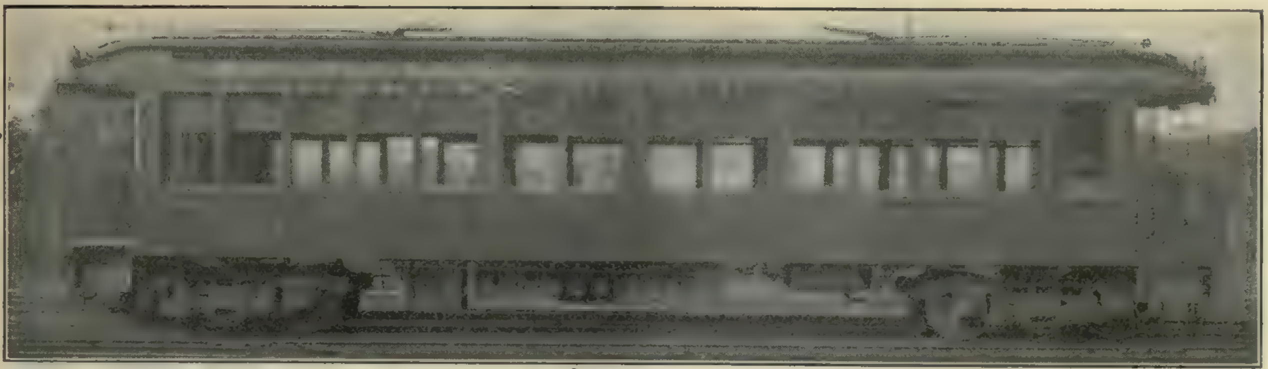

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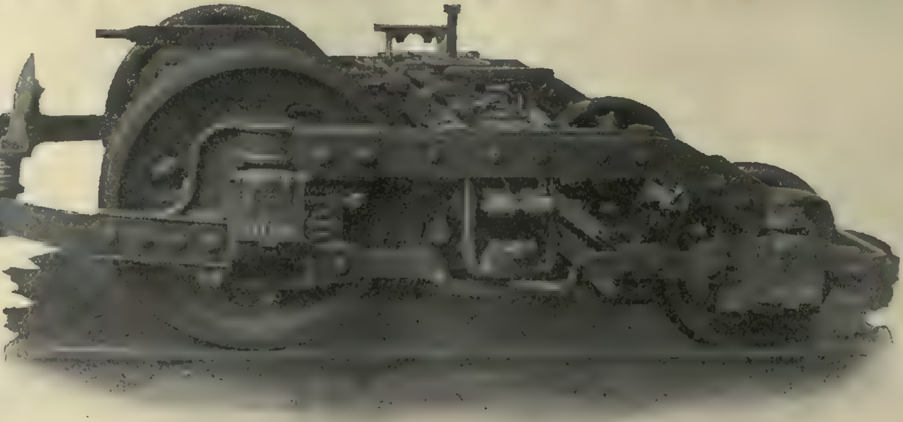

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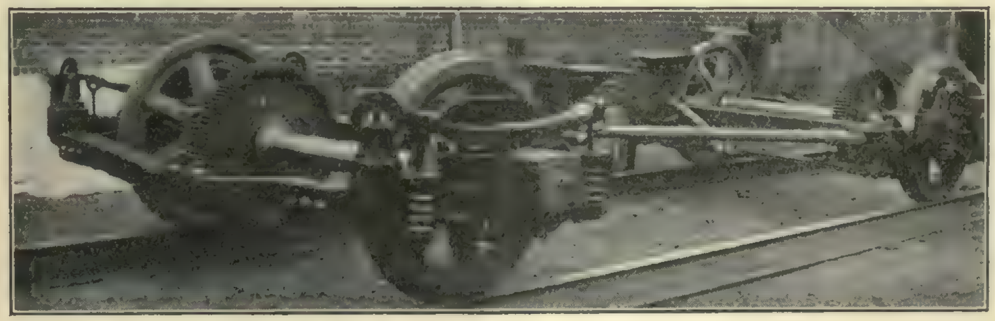

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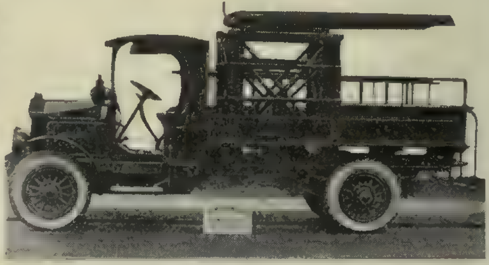

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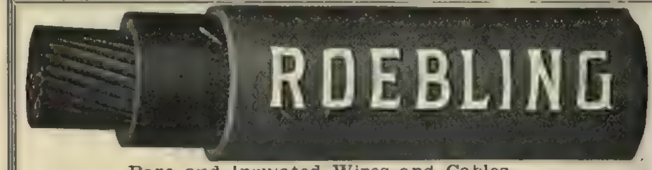

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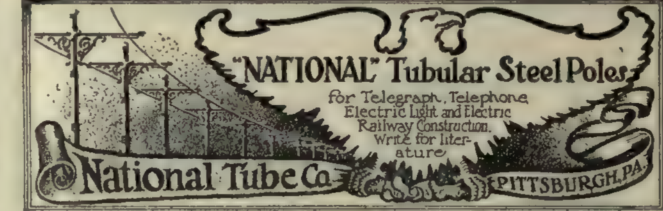

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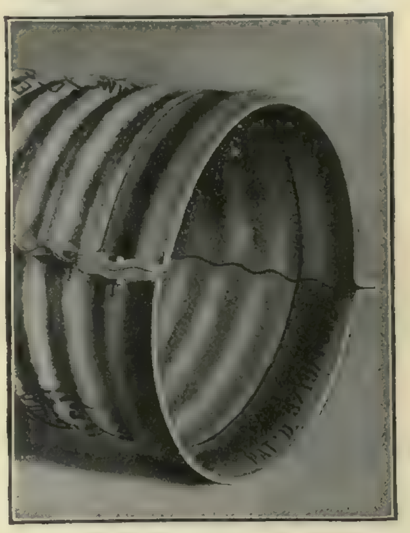

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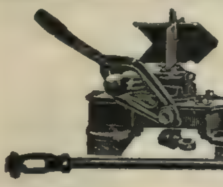

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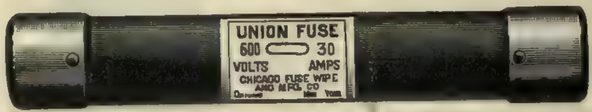

NEW "UNION" CATALOG We have just issued our No. 28 catalog, which combines the former Fuse and Box catalogs. It contains much valuable reference information, also complete descriptions of fuses for railway service.

Write for a copy.

CHICAGO FUSE MFG. CO.
CHICAGO NEW YORK

SAFETY STARTING WITH THIS SIGNAL

is insured by a green flash automatically given when doors are closed. It's a big time and trouble saver.

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Samson Spot Waterproofed Trolley Cord

Made of fine cotton yarn braided hard and smooth. Inspected and guaranteed free from flaws. Proved to be the most durable and economical. Samples and information gladly sent

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Manufacturers of the

ECLIPSE LIFE GUARD
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See the Crank of the

CREAGHEAD DESTINATION SIGN

By means of it, conductor or motorman can change sign without leaving platform. All that has to be done is to turn the crank. Better investigate

CREAGHEAD ENGINEERING CO., CINCINNATI, O.

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Sole Manufacturers

"HONEYCOMB" AND "ROUND JET" VENTILATORS
for Monitor and Arch Roof Cars, and all classes of buildings; also
ELECTRIC THERMOMETER CONTROL
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Cleveland Fare Box Co.
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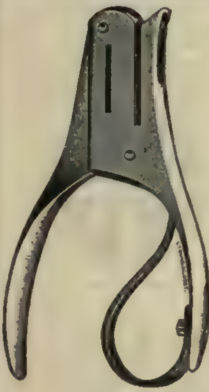

Our forty years of successful punch making are well demonstrated in the perfection of our product, which is Standard throughout the world.

These punches prove the most efficient, because they operate quickest and easiest, and the most economical because they wear longest.

Let us show you WHY.

Punchmakers since '72.

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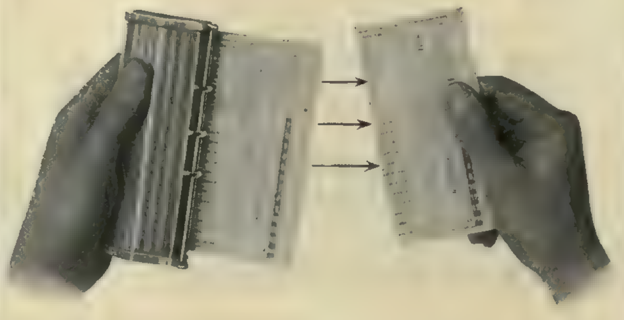
Eastern Electrical and Export Representatives.

Consider your best customers —the traveling Salesmen



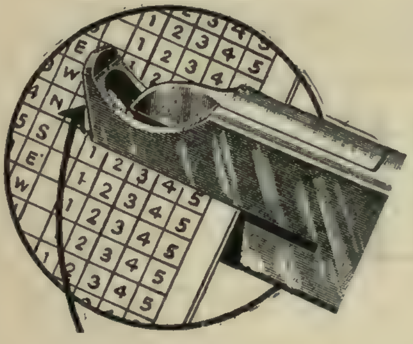
Many of them are obliged to turn over fare receipts with their expense accounts. They appreciate the

Macdonald Ticket and Ticket Box System

which enables them to easily keep track of their fare expense.

Macdonald equipped roads are well patronized.

The Macdonald Ticket & Ticket Box Co.
Cleveland, Ohio



See through it!

That's what you can do with a

BONNEY-VEHSLAGE VISIBLE PUNCH

That's what makes them so popular with your conductors.

That's why with B-V Punches your collectors, transfer and ticket agents can handle the big crowds quickly and efficiently.

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Send for prices and catalog.

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cars and station steps.

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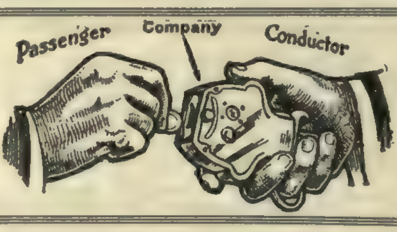

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MASON SAFETY TREADS—prevent slipping and thus obviate damage suits.
KARBOLITH CAR FLOORING—for steel cars is sanitary, fireproof and light in weight.
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Above products are used on all leading Railroads. For details address

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For the Answer to your Fare Collection Problems
Write for
"Earnings Per Passenger Mile"
It tells how the
BONHAM TRAFFIC RECORDER
Will Meet Your Needs
The Bonham Recorder Co., Hamilton, Ohio

THE EUREKA COMPANY

NORTH EAST, PENNSYLVANIA

In the April 14th issue of the Electric Railway Journal our advertisement as shown would indicate the main office to be 120 Broadway, New York. The New York Office is a branch office, and the Main Office is and will be at the Factory at *North East, Pennsylvania.*

H. & K. No. 300-A
Slat Seat for City Service

An inexpensive, sturdy, sanitary seat. It has all the famous Hale & Kilburn features, such as Pressed Steel Pedestals, "Walkover" reversing mechanism and proper shaping of seat and back to make riding comfortable. Furnished in polished Maple, Birch, Cherry, Ash, Oak or Mahogany. The vertical slatting of the back not only affords more comfort than horizontal slatting but is also much handsomer.

HK WALKOVER
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Philadelphia New York Chicago
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The Coal & Iron National Bank
of the City of New York

Capital, Surplus & Profits $1,635,000
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Offers to dealers every facility of a New York Clearing House Bank.

WE CAN CUT YOUR COST OF
HEATING CURRENT
Write for THERMOSTATIC CONTROL INFORMATION

GOLD

ELECTRIC HEATERS Cut Installation and Maintenance Charge.
VENTILATORS Also Ventilate in Stormy Weather.
THERMOSTATS Save Current.
ORIGINATED the use of NON-CORROSIVE Wire for Electric Car Heaters.
ORIGINATED The Ventilated Coil Support.

LET US FIGURE ON YOUR NEXT REQUIREMENTS
Gold Car Heating & Lighting Co., 17 Battery Pl., New York

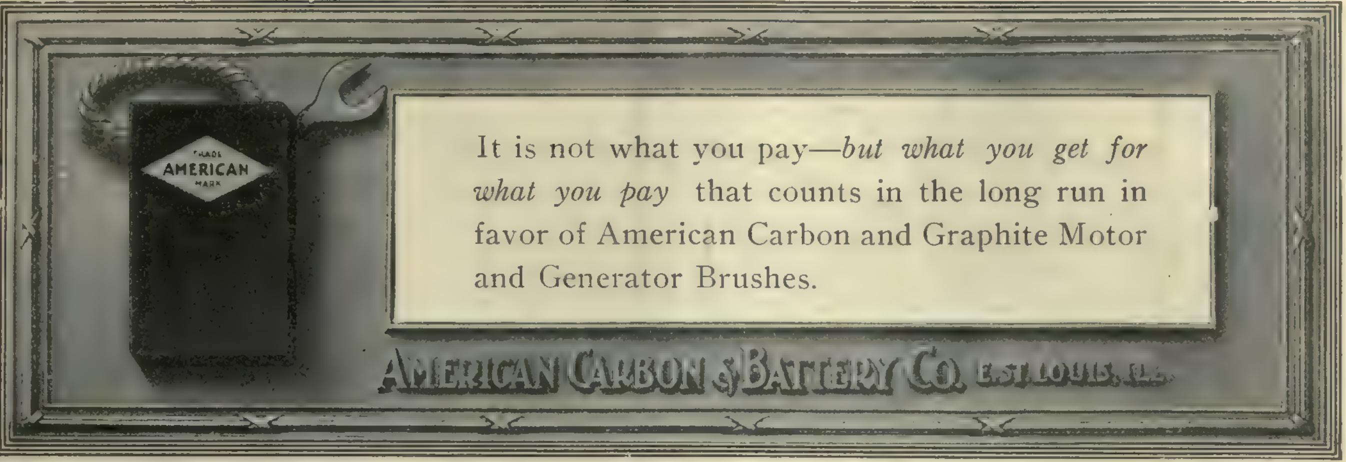
The Best Shade Rollers for Cars

SPECIAL shade rollers for cars, that will last and give satisfaction for years, and yet cost but little more than the poorest you can buy, are made by the Stewart Hartshorn Co., E. Newark, N. J. This company is by far the largest shade roller manufacturer in the world. It is able to give high quality at lower prices because of the enormous output. Write for catalog, stating wants. You are always protected when you buy shade rollers if they bear the signature Stewart Hartshorn

Ventilation—Sanitation—Economy—Safety
All Combined in
The Cooper Forced Ventilation Hot Air Heater
Patented September 30, 1913. Ask for the full story
We also Manufacture Pressed Steel Hot Water Heaters
THE COOPER HEATER CO. CARLISLE, PA.

Railroad and Tram Car Specialties
New inventions developed, perfected and worked for the English market
Messrs. G. D. Peters & Co., Ltd.
Moorgate Works, Moorfields, LONDON, E. C.

HEATING AND VENTILATING YOUR CARS is the problem to-day. Let us show you how to do both with one equipment. Now is the time to consider this change before you start your cars through the shops for overhauling. Kill two birds with one stone.
THE PETER SMITH HEATER COMPANY
1759 Mt. Elliott Ave., Detroit, Mich.



It is not what you pay—*but what you get for what you pay* that counts in the long run in favor of American Carbon and Graphite Motor and Generator Brushes.

AMERICAN CARBON & BATTERY CO. E. ST. LOUIS, ILL.

It takes you safely 'round Curves and over Crossings

Overhead the Simplex No. 2 Trolley Base keeps the wheel on the wire no matter how fast the turn is taken.

The roller bearing base assures easy turning. At crossings the wheel never jumps because the "higher the wire—more the tension" feature holds it tight against the trolley.

Simplex No. 2 Trolley Base

The ordinary trolley base gives 32 pounds tension at normal height and 16 pounds at crossings. The Simplex gives 32 pounds normal and 40 pounds at crossings.

The juice will never fail when you need it with a Simplex Base overhead.

Send for Bulletins.

The Trolley Supply Co., Canton, Ohio

The "Hycap-Exide" Battery
for
STORAGE BATTERY STREET CARS
THE ELECTRIC STORAGE BATTERY CO
PHILADELPHIA

HORNE RAILWAY DEVICES

- Horne Double Acting Brakes
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TULC

We base all our "ads" on facts. We guarantee TULC and stand back of it. Others have shown a large saving with TULC. It has been proven to be the best lubricant.

THE UNIVERSAL LUBRICATING CO.
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The Consolidated Car Fender Co., Providence, R. I.
Manufacturers of The Providence Fender and H-B Life Guard
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An Efficient Ventilator
at a reasonable price
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VAN DORN COUPLERS

are made for every condition and requirement. M. C. B. Pin and Link, Car and Air, in all sizes and types.

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Gears and Pinions

Peak loads, steep grades, sudden starting, stopping and reversing search out the weak spots of ordinary gears and put the trucks into the repair shop. Van Dorn gears are made with just these destroyers in mind. Our long experience taught us how.

Our years of specialized experience in making gears is worth money to you.

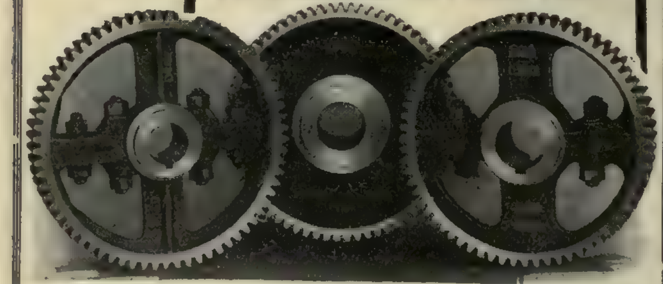
Let us quote on your needs Write Dept. A. B.

THE VAN DORN & DUTTON CO.

Gear Specialists,

CLEVELAND, OHIO

Sales Offices: Chicago, St. Louis, Kansas City, Boston, New York, Atlanta, Cincinnati, Toronto, Milwaukee, San Francisco, Denver.



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Nuttall Service

These are described in a series of booklets that you should have on file. They are yours for the asking. Address us at

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Wheel Condition No. 4

When the flange only needs correction, this type of

Wheel Truing Brake Shoe

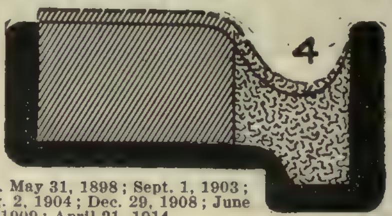
Pat. May 31, 1898; Sept. 1, 1903; Aug. 2, 1904; Dec. 29, 1908; June 15, 1909; April 21, 1914.

will do it—without jacking car up—without removing trucks—without removing car from service.

It's the economical, efficient way.

Wheel Truing Brake Shoe Co.

Detroit Michigan



COOL RUNNING—LONG WEARING

It is where traffic conditions on electric railways call for hard, heavy work that you will find the trucks fitted with AJAX Car Brasses. This is because AJAX Car Brasses run cool, wear long, resist road shocks, are economical, and give unusual satisfaction in every way. Specify AJAX for repairs and new equipment.

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Established 1880

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Steel for Service

There is too much at stake from a safety standpoint, to say nothing of other conditions, to warrant the use of any but the best wheels in the present service on electric roads. More than 200,000

Carnegie Rolled Steel Wheels

are now in such service.

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STUCKI

SIDE BEARINGS

are truly frictionless. The roller instead of turning on a pin rolls freely like a rolling pin.

A. Stucki Co.

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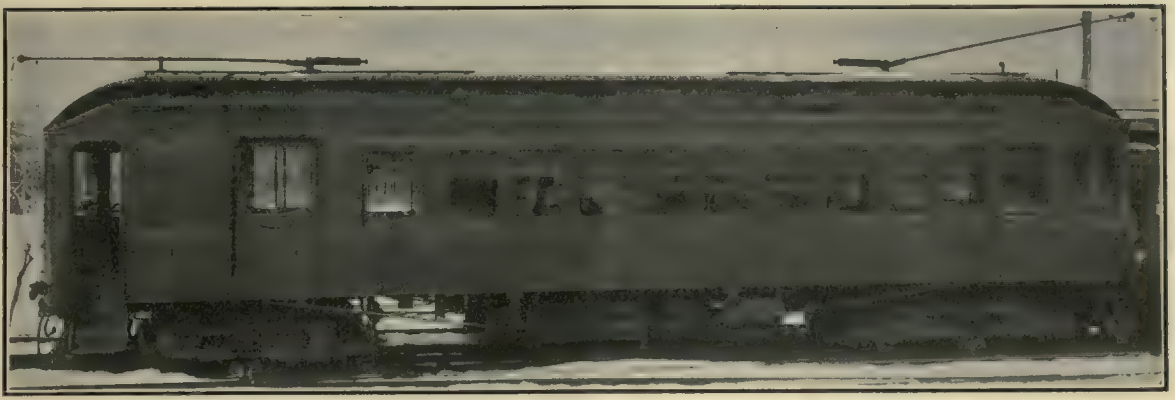

Ready for Service — Immediate Shipment

No. 6. Six 52′ x 9′ 6″ Brill cars, Brill 27E trucks, 6′ 6″ wheelbase, 6″ axles, new 36″ MCB dropped forged steel wheels; four GE 66-B 125 to 150-hp. motors; new "M" control double-end operation; straight and automatic air brakes with two engineer's valves on each end of car. Speed 60 miles. Like new throughout. Ready for service. Immediate shipment.

We have purchased these splendid cars from the Wilkes-Barre & Hazelton R.R. Co. at Hazelton, Penna.. and offer for quick sale at tremendous price reduction. Telegraph us for inspection order if interested for immediate shipment. The electrical equipment is installed in a superior manner. Suitable for passenger, express, freight and locomotive service. With suitable gears will pull 800-ton load 20 miles per hour.

FOR SALE: Rails, Cars, Motors, Locomotives, all types.

WANTED TO PURCHASE: All available items. Send us your offerings.

CHARLES F. JOHNSON CAR COMPANY, 120 Liberty Street, New York, N. Y.

Service

You get more than simply BRAKE SHOES when you use our Product.

You get the advantage of our constant effort to improve our product for your service.

You get the earnest co-operation of our engineers to assist you in getting the full quota of service from each Brake Shoe applied.

Miles of service from the Brake Shoe are more to be desired than pounds of scrap.

All of which means increased efficiency and decreased cost of Brake Maintenance.

American Brake Shoe & Foundry Co.
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SEARCHLIGHT SECTION

FOR SALE

4—15 bench open cars with motors, trucks and air-brake equipment.

4—13 bench open cars with motors, trucks and air-brake equipment.

1—15 bench open car, no equipment.

10—10 bench open cars with single trucks and motors.

4—20′ closed cars with single trucks and motors.

15,000 pounds of No. 10 hard drawn bare copper telephone wire.

8—Brand new G. E. 201-H. railway motors complete.

8—West. 49 railway motors complete.

2—West. 38-B railway motors complete.

4—West. 38-B armatures, second-hand.

35—Second-hand AA1 air compressors.

For further particulars apply to

W. R. KERSCHNER COMPANY, INC.
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Rotary Converters

25 Cycle

One 1500 KW. Gen. Elec. HC-N, 6 ph., 263 V. D.C., 14 pole, 214 RPM.

One 600 KW. Gen. Elec. TC-A, 3 ph., 600 volt D.C., 375 volt A.C., 8 pole, 375 RPM.

Four 500 KW. Gen. Elec. HC-K, 600 volt D.C., 4 pole, 750 RPM., each rotary complete with three 165 Kva. Gen. Elec. OI SC transformers, HP-RP, 6600/5940 volts prim., 430/286/143 volts sec., also necessary panels with instruments.

One 500 KW. Westg. 3 ph., 550 volt D.C., 390 volt A.C., 6 pole, 500 RPM., with dir. conn. starting motor; A.C. and D.C. panels, and three 175 KW. Westg. oil cooled transformers, 13200 volts prim., 390 volts sec.

One 250 KW. Gen. Elec. TC-A, 3 ph., 550 volts D.C., 350 volts A.C., 4 pole, 750 RPM.

Two 250 KW. Gen. Elec. TC-D, 3 ph., 275 volt D.C., 169 volt A.C., 4 pole, 750 RPM., each with A.C. & D.C. panels, and three 100 KW. G. E., type H, single ph., oil cooled transformers, 6600/5600 volts prim., 176 volts sec.

60 Cycle

One 500 KW. Gen. Elec. HC., 6 ph., 600 volt D.C., 424 volt A.C., 6 pole, 1200 RPM., with switchboard panel and three 185 Kva. G. E., OI SC single ph. transformers, 2300 volts prim., 424 volts secondary.

One 300 KW. Westg. 2 ph., 525/575 volt D.C., with two 165 KW. Westg. oil insulated transformers, 2200 volt prim., 367/430 volt sec.

One 200 KW. Westg. 3 ph., 600 volt D.C., 370 volt A.C., 10 pole, 720 RPM., with dir. conn. starting motor.

One 100 KW. Westg. 2 ph., 550 volt D.C., 8 pole, with dir. conn. starting motor.

MacGovern & Company
INC.
114 Liberty Street, New York City

IMMEDIATE SHIPMENT

Turbines

2—1250 KVA. Westinghouse Horizontal Turbo Generating Units, wound for 3 phase, 60 cycles, 2200 volts. Each unit complete with 4500 sq. ft. Worthington surface condenser, circulating pump, rotary dry vacuum pump and wet vacuum pump. Designed for 150 lb. steam pressure. Turbines fitted with bronze blading.

25 Cycle Rotary Converters

2—150 KW. General Electric type T.C., 4-150-750, 25 cycle, 3 ph., 575 volt, rotary converters, 750 rpm., complete with end play and speed limit device.

150 Kilowatt 60 Cycle Rotary Converters

2—150 KW. Westinghouse 3 ph., 60 cy. rotary converters, 550 volts, 273 amps., 720 rpm., complete with 4—100 KW. Westinghouse Scott connected oil insulated transformers, 10,000/9500 volts prim., 430/362 volts secy.

Transformers

6—750 KVA. General Electric oil filled self cooled transformers, 4400/281 volts, with 4400-4290-4180-4070-2200-2090-1980 taps in the primary.

3—500 KW. General Electric, 60 cy., single phase transformers, 66,000 volts primary, 4400/2200 volts secondary.

3—350 KVA. General Electric, type H, 60 cy., transformers 2400/2300/2200 v. prim., 200/400 v. secy.

3—150 KW. General Electric type H, single phase, 25 cy., O.I.S.C., transformers, 6600-230/115 volts, complete with oil.

4—100 KW. Wagner single phase, 60 cycle, 6600 volts primary, 2050/2300 volts secy., complete with oil.

4—100 KW. Westinghouse, oil insulated, Scott connected transformers, 10,000/9500 v. primary, 430/362 v. secondary.

3—75 KW. Westinghouse 60 cy. transformers, 2200 v. prim., 110/220/440 v. secy.

3—50 KVA. General Electric type H. 60 cy. transformers, 900/10000/16000 v. prim. Y., 230/460 v. secy.

Also a stock of smaller sized transformers.

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OPEN and CLOSED
MOTOR and TRAIL

Write for Price and Full Particulars to

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Commonwealth Bldg. Philadelphia, Pa.

COMPLETE ARMATURES FOR SALE

FOR ALL THE STANDARD STREET RAILWAY MOTORS

GET OUR PRICE WE CAN SAVE YOU MONEY

America's Greatest Repair Works

CLEVELAND ARMATURE WORKS, Cleveland, O.

FOR SALE

One 3 phase, 60 cycle, 2300 volt, 1800 r.p.m., G. E., 500 K. V. A.

Vertical Turbo Generator

complete with condenser, pumps and all accessories. Reply to

COLUMBIA CONSTRUCTION CO.,
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ELECTRIC RAILWAY JOURNAL

SEARCHLIGHT SECTION

FOR SALE

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Two four thousand kilowatt, 13200 volt, 25 cycle, 300 r.p.m., 3 phase, revolving field type, with shaft, base and bearings. Practically new. Can ship at once. Address H. U. Roeding & Co., Foxcroft Building, San Francisco.

Track Grinders for Sale

Two Kerwin grinders, second hand in good condition. Immediate shipment. Cumberland County Power & Light Co., Portland, Me.

Immediate Shipment

Ridgway Dynamo & Engine Co. 200 kw. Generator, 500 volt. As good as new. Must sell quickly. Direct connected.

M. K. FRANK
Frick Bldg., Pittsburgh, Pa.

Rail Grinder

A Kerwin machine, in first-class condition. Address Purchasing Department Union Traction Company of Indiana, Anderson, Ind.

FOR SALE
4 complete 4
Motor Car Equipments

Each consisting of 4 Westinghouse 306 C motors. 1—K 35 G. 2 controller—4, 68 tooth solid gears, grade M. 1—200 ampere, style 44887-D Westinghouse overhead circuit breaker, complete set of axle bearings for 5" axles. One set resistance banks, one fuse block, one kick coil. Also one extra armature, two extra gears, one extra set axle bearings and some minor supplies for repairs. For price and complete description apply to

Kansas City, Kaw Valley & Western Railway Co.
Bonner Springs, Kans.

STEEL RAILS
FOR IMMEDIATE SHIPMENT

RELAYS

2200 tons—70 lb. 920 tons—75 lb.

A. S. C. E. Section with Angles

NEW

300 tons 75 lb. with Heavy Splices
280 tons 85 lb. with Angles
1000 tons 90 lb. with Angles

Exceptional opportunity. Also large quantity other Section. WIRE

ZELNICKER
WALTER A. ZELNICKER SUPPLY COMPANY
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Armature Coil Taping Machine

Saves Time, Labor and Money

A boy can tape 40 coils for Westinghouse 12A Armature in an hour. Further particulars gladly furnished.

Geo. M. Griswold Machine Co.
New Haven, Conn.

FOR SALE

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.

We positively own these Rails and offer same in carload lots and over.

25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.

Immediate shipment guaranteed and prices very attractive.

Carload and less than carload inquiries and orders solicited.

Rails cut to length for structural purposes.

Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Bldg. Pittsburgh, Pa.

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Wanted at Once

For immediate shipment any quantity of battery lead plates, sediment scrap copper and wire, brass and all other grades of scrap material. Write to us today for our prices. National Metal & Rubber Co., 31 India Wharf, Boston, Mass.

Wanted to Buy

One 400 K.W., 600 volt, rotary converter with switchboard and transformers for 33,000 volt to 390 volt, 25 cycle, three phase. Union Traction of Indiana, Anderson, Ind.

WANTED

One second-hand 550 volt, Direct Current

Street Railway Generator

belt driven, capacity 300 to 400 K.W. Address Light, Heat, Power & Water Depts., Queen Street, Kingston Ont.

AGENTS AND SALESMEN

Salesman Wants Position

Successful car specialty salesman, 5 years' experience, wants change of position. Several years in operating department. Wide acquaintance. References. Box 1487, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

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CHIEF engineer of car building plant desires change June 1st. Formerly car builder and pattern maker for twelve years; six years as draftsman and engineer. Present position includes six years' experience as chief engineer, part of this time as traveling salesman. Prefer estimating or traveling position with car manufacturing or supply company. P. A. Thomas, High Point, N. C.

DRAFTSMAN desires position with operating company. Have ten years of varied experience. Box 1495, Elec. Ry. Journal, Real Estate Trust Bldg., Philadelphia, Pa.

ELECTRICAL engineer, college graduate, single, age 31, 5 years' railway experience, especially maintenance and design of equipment, open for engagement. Box 1493, Elec. Ry. Journal.

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EXECUTIVE, broad experience in operation, construction, engineering, now engaged, desires better connection. Box 1468, Elec. Ry. Journal, Real Estate Trust Bldg., Philadelphia, Pa.

GENERAL superintendent or superintendent, transportation. I can increase your net receipts. Will you give me the opportunity? Box 1472, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

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YOUNG married man desires to take charge of accounting for street railway or lighting company. Can handle accounting for interstate road. References. Box 1486, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

POSITIONS VACANT

APPLICATIONS for positions as blacksmith, car carpenters, truck repairmen, motor repairmen, car electrician, armature winder, painters, pitmen wanted. No trouble. State age, qualifications, experience, salary wanted, references in first letter. A-1 men only need apply. Address Box 1484, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

BOOKKEEPER to take charge of set of books for large electric railway. Applicants must give reference, state experience and age. Box 1467, Elec. Ry. Journal.

FOUR experienced interurban crews wanted. Must be good, clean, honest and industrious men. Permanent position for right men. Box 1485, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

GENERAL storekeeper wanted by a company in eastern Pennsylvania, operating 200 miles of street railway lines and an electric department serving a community of 150,000 people, to inaugurate an up-to-date storekeeping system and take general charge of caring for stores in storehouses and field. Must be thoroughly experienced in this line of work and have executive ability. Apply by mail, stating age, qualifications, salary to commence and references. Box 1490, Elec. Ry. Journal, Real Estate Trust Bldg., Philadelphia, Pa.

GENERAL ledger bookkeeper wanted in accounting department of large public service company in eastern Pennsylvania, operating street railway and electric properties. Must be thoroughly experienced in public utility accounting. Apply by mail, stating age, qualifications, salary to commence and references. Box 1491, Elec. Ry. Journal, Real Estate Trust Bldg., Philadelphia, Pa.

NIGHT foreman, shops. High-speed interurban line near Chicago. Man familiar with type-M control and G. E.-66 motors preferred. Box 1471, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

WANTED at once an all-round car repair man, small road operating from two to five cars. $20 per week. Cheyenne Electric Ry. Co., Cheyenne, Wyo.

EMPLOYMENT AGENCIES

Correspondence Service

The undersigned provides a confidential service designed to locate openings through correspondence for men earning not less than $2,500 and up to $25,000; all lines. Not an employment agency, but a constructive, initiative service, covering individual negotiations. Established 1910. Complete privacy assured; present connections in no way jeopardized. Send name and address only for explanatory details. R. W. Bixby, 81 Niagara Square, Buffalo, N. Y.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

More than 300 different products are here listed.

The Alphabetical Index (see eighth page following) gives the page number of each advertisement.

As far as possible advertisements are so arranged that those relating to the same kind of equipment or apparatus will be found together.

This ready-reference index is up to date, changes being made each week.

If you don't find listed in these pages any product of which you desire the name of the maker, write or wire Electric Railway Journal, and we will promptly furnish the information.

Acetylene Apparatus. (See Cutting Apparatus, Oxy-Acetylene.)

Acetylene Service.
Oxweld Acetylene Co.

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Horne Mfg. Co.

Alloys, Steel & Iron.
Titanium Alloy Mfg. Co.

Alloys, and Bearing Metals. (See Bearings and Bearing Metals.)

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Automobiles and Buses.
Brill Co., The J. G.
General Vehicle Co.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
National Railway Appliance Co.
National Tube Co.
St. Louis Car Co.
Standard Steel Works Co.
Taylor Electric Truck Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
American Railway Supply Co.
Electric Service Supplies Co.
International Register Co.
Woodman Mfg. & Supply Co., R.

Bankers and Brokers.
Coal & Iron National Bank.
National City Co.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
St. Louis Car Co.
Taylor Elec. Truck Co.
Westinghouse Elec. & M. Co.

Bearings, Center.
Baldwin Locomotive Works.
Holden & White, Inc.

Bearings, Oil-less, Graphite, Bronze and Wood.
Bound Brook Oil-less Bearing Co.

Bearings, Roller and Ball.
Gurney Ball Bearing Co.
Railway Roller Bearing Co.

Bearings, Roller Side.
Holden & White, Inc.
Stucki Co., A.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Watson-Stillman Co.
Zelnicker Supply Co., W. A.

Blasting Powder & Equipment.
Du Pont de Nemours & Co., E. I.

Blow Torches for Soldering and Brazing. (See Cutting Apparatus, Oxy-Acetylene.)

Blowers.
General Electric Co.
Westinghouse Elec. & M. Co.

Boiler Cleaning Compounds.
Dearborn Chemical Co.

Boiler Graphite.
Dixon Crucible Co., Joseph.

Boiler Tubes.
National Tube Co.

Boilers.
Babcock & Wilcox Co.

Bond Clips.
Electric Railway Improve. Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improve. Co.
Ohio Brass Co.
Oxweld Acetylene Co.

Bonding Tools.
American Steel & Wire Co
Electric Railway Improve Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improve. Co.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Bonds, Welded.
Lincoln Bonding Co.

Book Publishers.
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Piling and Lumber.)
Bates Expanded Steel Truss Co.
Creaghead Engrg. Co.
Electric Ry. Equipment Co.
Electric Service Supplies Co.
Hubbard & Co
International Creo. & C. Co.
Lindsley Bros. Co.
Ohio Brass Co.

Brake Adjusters.
Holden & White, Inc.
Smith-Ward Brake Co.

Brake Shoes.
American Brake S. & Fdy. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Long Co., E. G.
St. Louis Car Co
Taylor Elec. Truck Co.
Wheel Truing Brakeshoe Co.

Brakes, Brake Systems and Brake Parts.
Ackley & Co., G. S.
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Br. Westinghouse E. & M. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
Long Co., E. G.
National Brake Co.
St. Louis Car Co.
Safety Car Devices Co.
Taylor Elec. Truck Co.
Westinghouse Trac. Brake Co.

Brazing. (See Welding.)

Brooms, Track, Steel or Rattan.
Zelnicker Supply Co., W. A.

Brushes, Carbon.
American Carbon & Battery Co.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
Dixon Crucible Co., Jos.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Eureka Co.

Bumpers, Car Seat.
Electric Service Supplies Co.

Bushings, Case Hardened Manganese.
Bemis Car Truck Co.

Bushings, Fibre.
Diamond State Fibre Co.

Bushings, Graphite & Wooden.
Bound Brook Oil-less Bearing Co.

Buttons. (See Badges and Buttons.)

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc., see those Headings.)

Car Stop, Automatic.
Consolidated Car-Heating Co.

Car Trimmings. (For Curtains, Doors, Seats, etc., see those Headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Jewett Car Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Stephenson Co., John.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co.
Kerschner Co., Inc., W. R.

Cars, Self-Propelled.
Br. Westinghouse E. & M. Co.
Electric Storage Battery Co.
General Electric Co.

Castings, Brass.
Columbia M. W. & M. I. Co.
Eureka Co.
Frankel Connector Co.

Castings, Composition or Copper.
Anderson M. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.

Castings, Gray Iron and Steel.
American B. S. & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St Louis Car Co.
Standard Steel Works Co.
Union Electric Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
American Brake S. & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Eclipse Railway Supply Co.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
Ohio Brass Co.
Trolley Supply Co.
Wood Co., C. N.

Ceiling, Car.
Keyes Products Co.
Pantasote Co., The.

Chargers, Storage Battery.
General Electric Co.

Checks, Employees.
American Railway Supply Co.

Chemists.
Little, Inc., Arthur D.

Circuit Breakers.
Cutter Electrical & Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors, for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Dossert & Co.
Electric Service Supplies Co.
Frankel Connector Co.
General Electric Co.
Hubbard & Co.
Klein & Sons, M.
Ohio Brass Co.
Westinghouse Elec. & M Co.

Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.
Van Dorn & Dutton Co.

Cleats, Car Wiring.
General Electric Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling. (See Conveying and Hoisting Machinery.)

Coasting Clocks.
Railway Improvement Co.

Coil Banding and Winding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Coils, Armature and Field.
Cleveland Armature Works
Coil Mfg. & Repair Co.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
Electric Service Supplies Co.
International Register Co.
Johnson Fare Box Co.

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Wood Co., C. N.

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One of the Portable Electrodynamometer Group, which also includes Model 310 Single Phase and D.C. Wattmeter, Model 329 Polyphase Wattmeter and Model 341 A.C. and D.C. Voltmeter.

The characteristics of the group are extreme accuracy (guaranteed within a fraction of 1% full scale value), adaptability for use on circuits of any commercial frequency and any wave form, great overload capacity, low moment of inertia, effective damping and shielding, and the legibility and remarkable uniformity of the hand calibrated scales.

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Weston Indicating Instruments include a great variety of groups for portable or switchboard service on A. C. or D. C. Circuits, Instruments designed expressly for testing and laboratory use, for motor, car and boat electrical systems, and many others for special purposes. Write for Bulletins or Catalogs describing those which interest you.

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Denver
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What's the usual result of an overload on your car motors or compressors?

A puff of smoke—followed by a trip to the repair shop. You can eliminate these trips by using

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Fireproof Wire**

motor field, armature and compressor coils. You can't burn out Salamander Wire Coils. We've had them red-hot on test without any breakdown.

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Garland Ventilator
Electric Arc Welders
High Class Railway Varnishes and Enamels
Elastic Car Waste

Special Agents for
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Johnson Fare Box Co.
C. & C. Electric & Mfg. Co.
Holden & White

General Agents for Anglo-American Varnish Co.
Eastern Agents for Union Fibre Co.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

Commutator Truing Devices.
General Electric Co.

Commutators or Parts.
Cameron Elec'l Mfg. Co.
Cleveland Armature Works.
Coil Mfg. & Repair Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Long Co., E. G.
Mica Insulator Co.
Westinghouse Elec. & M. Co.

Compressors, Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Trac. Brake Co.

Condensers.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Conduits, Flexible.
Tubular Woven Fabric Co.

Conduits, Underground.
Standard Underground Cable Co.

Connectors, Solderless.
Frankel Connector Co.
Horne Mfg. Co.

Controller Fingers.
Horne Mfg. Co.

Controller Regulators.
Electric Service Supplies Co.

Controllers or Parts.
Allis-Chalmers Mfg. Co.
Br. Westinghouse E. & M. Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Westinghouse Elec. & M. Co.

Controlling Systems.
General Electric Co.
Westinghouse Elec. & M. Co.

Converters, Rotary.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Conveying and Hoisting Machinery.
Columbia M. W. & M. I. Co.
Green Eng'g Co.
Hunt Co., Inc., C. W.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co.
Long Co., E. G.
Roebling's Sons Co., John A.
Samson Cordage Works.
Trolley Supply Co.

Cord Connectors and Couplers.
Electric Service Supplies Co.
Samson Cordage Works.
Wood Co., C. N.

Couplers, Car.
Brill Co., The J. G.
Long Co., E. G.
Ohio Brass Co.
Van Dorn Coupler Co.
Westinghouse Trac. Brake Co.

Couplings, Conduit.
Horne Mfg. Co.

Cranes. (See also Hoists.)
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.
Van Dorn & Dutton Co.

Creosoting. (See Wood Preservatives.)

Cross Arms. (See Brackets.)

Crossing Foundations.
International Steel Tie Co.

Crossing Signals. (See Signals, Crossing.)

Crossings, Track. (See Track, Special Work.)

Culverts.
American Rolling Mill Co.
Bark River B. & Culvert Co.
California Cor. Culvert Co.
Canada Ingot & Iron Co., Ltd.
Canton Culvert & Silo Co.
Coast Culvert & Flume Co.
Corrugated Culvert Co.
Delaware Metal Culvert Co.
Dixie Culvert & Metal Co.
Hardesty Mfg. Co., R.
Illinois Corrugated Metal Co.
Independence Culvert Co.
Iowa Pure Iron Culvert Co.
Kentucky Culvert Mfg. Co.
Lee-Arnett Co.
Lone Star Culvert Co.
Lyle Corrugated Culvert Co.
Michigan Bridge & Pipe Co.
Montana Culvert Co.
Nebraska Culvert Co.
Nevada Metal Mfg. Co.
New England Metal Cul. Co.
North East Metal Co.
Northwestern Sheet & I. Wks.
O'Neall Co., W. Q.
Ohio Corrugated Culvert Co.
Pennsylvania Metal Cul. Co.
Road Supply & Metal Co.
Sioux Falls Metal Cul. Co.
Spokane Corr. Cul. Co.
Tennessee Metal Culvert Co.
Utah Corr. Cul. & Flume
Virginia Metal & Culvert Co.
Western Metal Mfg. Co.
Wyatt Mfg. Co.

Curtains and Curtain Fixtures.
Brill Co., The J. G.
Du Pont Fabrikoid Co.
Edwards Co., Inc., The O. M.
Electric Service Supplies Co.
Hartshorn Company, Stewart.
Pantasote Co., The.
St. Louis Car Co.

Cutting Apparatus, Oxy-Acetylene.
Oxweld Acetylene Co.

Derailing Devices.
Cleveland Frog & Crossing Co.

Destination Signs.
Columbia M. W. & M. I. Co.
Creaghead Engrg. Co.
Electric Service Supplies Co.

Detective Service.
Wisch Service, P. Edward.

Dispatching Systems.
Simmen Auto. Ry. Sig. Co.

Door Operating Devices.
Consolidated Car-Heating Co.
Safety Car Devices Co.

Doors and Door Fixtures.
Brill Co., The J. G.
Edwards Co., Inc., The O. M.
Hale & Kilburn Co.

Doors, Steel Rolling.
Kinnear Mfg. Co.

Doors, Trap.
Edwards Co., The O. M.

Draft Rigging. (See Couplers, Car.)

Drills, Track.
American Steel & Wire Co.
Electric Service Supplies Co.
Long Co., E. G.
Niles-Bement-Pond Co.
Ohio Brass Co.

Dryers, Sand.
Electric Service Supplies Co.
Zelnicker Supply Co., W. A.

Engineers, Consulting, Contracting and Operating.
Archbold-Brady Co.
Arnold Co., The.
Byllesby & Co., H. M.
Drum & Co., A. L.
Ford, Bacon & Davis.
Hunt & Co., Robert W.
Jackson, D. C. & Wm. B.
Little, Inc., Arthur D.
Neiler, Rich & Co.
Richey, Albert S.
Sanderson & Porter.
Sargent & Lundy.
Scofield Engineering Co.
Stone & Webster Eng'g Corp.
Westinghouse Church Kerr & Co.
White Companies, The J. G.
Woodmansee & Davidson, Inc.

Engines, Gas and Oil.
Allis-Chalmers Mfg. Co.
Westinghouse Elec. & M. Co.

Engines, Steam.
Allis-Chalmers Mfg. Co.
Westinghouse Elec. & M. Co.

Extension Platform Trap Doors.
Edwards Co., Inc., The O. M.

Fare Boxes.
Brill Co., The J. G.
Cleveland Fare Box Co.
Dayton Fare Recorder Co.
International Register Co., The.
Johnson Fare Box Co.
Ohmer Fare Register Co.

Fences, Woven Wire, and Fence Posts.
American Steel & Wire Co.

Fencing, Wire.
American Steel & Wire Co.
Page Woven Wire Fence Co.

Fenders and Wheel Guards.
Brill Co., The J. G.
Cleveland Fare Box Co.
Consolidated Car Fender Co.
Eclipse Railway Supply Co.
Electric Service Supplies Co.
Horne Mfg. Co.
Star Brass Works.
Trolley Supply Co.

Fibre.
Diamond State Fibre Co.
Westinghouse Elec. & M. Co.

Fibre Tubing.
Diamond State Fibre Co.
Westinghouse Elec. & M. Co.

Fibre Insulation.
National Ry. Appliance Co.

Field Coils. (See Coils.)

Flooring, Composition.
American Mason Safety T. Co.

Forgings.
Columbia M. W. & M. I. Co.
Eureka Co.
Standard Steel Works Co.

Furniture, Metal Office.
Edwards Co., Inc., The O. M.

Fuses and Fuse Boxes.
Chicago Fuse Mfg. Co.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
Daum, A. F.
General Electric Co.
Westinghouse Elec. & M. Co.

Fuses, Refillable.
Columbia M. W. & M. I. Co.
Economy Fuse & Mfg. Co.
General Electric Co.
Horne Mfg. Co.

Gages, Oil and Water.
Ohio Brass Co.

Gaskets.
Diamond State Fibre Co.
Power Specialty Co.

Gas-Electric Cars.
General Electric Co.

Gas Producers.
Westinghouse Elec. & M. Co.

Gates, Car.
Brill Co., The J. G.
Jewett Car Co.

Gear Blanks.
Carnegie Steel Co.
Diamond State Fibre Co.
Standard Steel Wks. Co.

Gear Cases.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Kerschner Co., Inc., W. R.
National Ry. Appliance Co.
Westinghouse Elec. & M. Co.

Gears and Pinions.
Ackley & Co., G. S.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Diamond State Fibre Co.
Electric Service Supplies Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
National Ry. Appliance Co.
Nuttall Co., R. D.
Van Dorn & Dutton Co.

Generating Sets, Gas-Electric.
General Electric Co.

Generators, Alt.-Current.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Generators, Dir.-Current.
Allis-Chalmers Mfg. Co.
Dick, Kerr & Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Gongs. (See Bells and Gongs.)

Graphite.
Dixon Crucible Co., Joseph
Morgan Crucible Co.

Grates, Chain.
Green Eng'g Co.

Greases. (See Lubricants.)

Grinders and Grinding Wheels.
Indianapolis Switch & Frog Co.

Grinders, Portable, Electric.
General Electric Co.
Goldschmidt Thermit Co.
Indianapolis Switch & Frog Co.
Railway Track-work Co.

Grinders, Rail.
Norton Co.

Guards, Trolley.
Ackley & Co., G. S.
Electric Service Supplies Co.
Ohio Brass Co.

Harps, Trolley.
Anderson M. Co., A. & J. M.
Bayonet Trolley Harp Co.
Electric Service Supplies Co.
Nuttall Co., R. D.
Star Brass Works.

Headlights.
Electric Service Supplies Co.
General Electric Co.
Long Co., E. G.
Ohio Brass Co.
St. Louis Car Co.
Trolley Supply Co.
Westinghouse Elec. & M. Co.

Headlinings.
Kerschner Co., Inc., W. R.
Keyes Products Co.
Pantasote Co., The.

Heaters, Car, Electric.
Consolidated Car-Heating Co.
Gold Car Heating & Lighting Co.
Smith Heater Co., Peter.

Heaters, Car, Hot Air.
Cooper Heater Co.
Smith Heater Co., Peter.

Heaters, Car, Hot Water.
Cooper Heater Co.
Smith Heater Co., Peter.

Heaters, Car, Stove.
Electric Service Supplies Co.
Smith Heater Co., Peter.

Hoists and Lifts.
Columbia M. W. & M. I. Co.
Duff Manufacturing Co.
Ford Chain Block & Mfg. Co.
Niles-Bement-Pond Co.
Van Dorn & Dutton Co.
Yale & Towne Mfg. Co.

Hose Bridges.
Ohio Brass Co.

Hydraulic Machinery.
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.
Watson-Stillman Co.

Hydrogrounds.
Horne Mfg. Co.

Inspection.
Elec'l Testing Laboratories.
Hunt & Co., Robert W.

Instruments, Measuring, Testing and Recording.
General Electric Co.
Sangamo Electric Co.
Westinghouse Elec. & M. Co.
Weston Elec'l Instrument Co.

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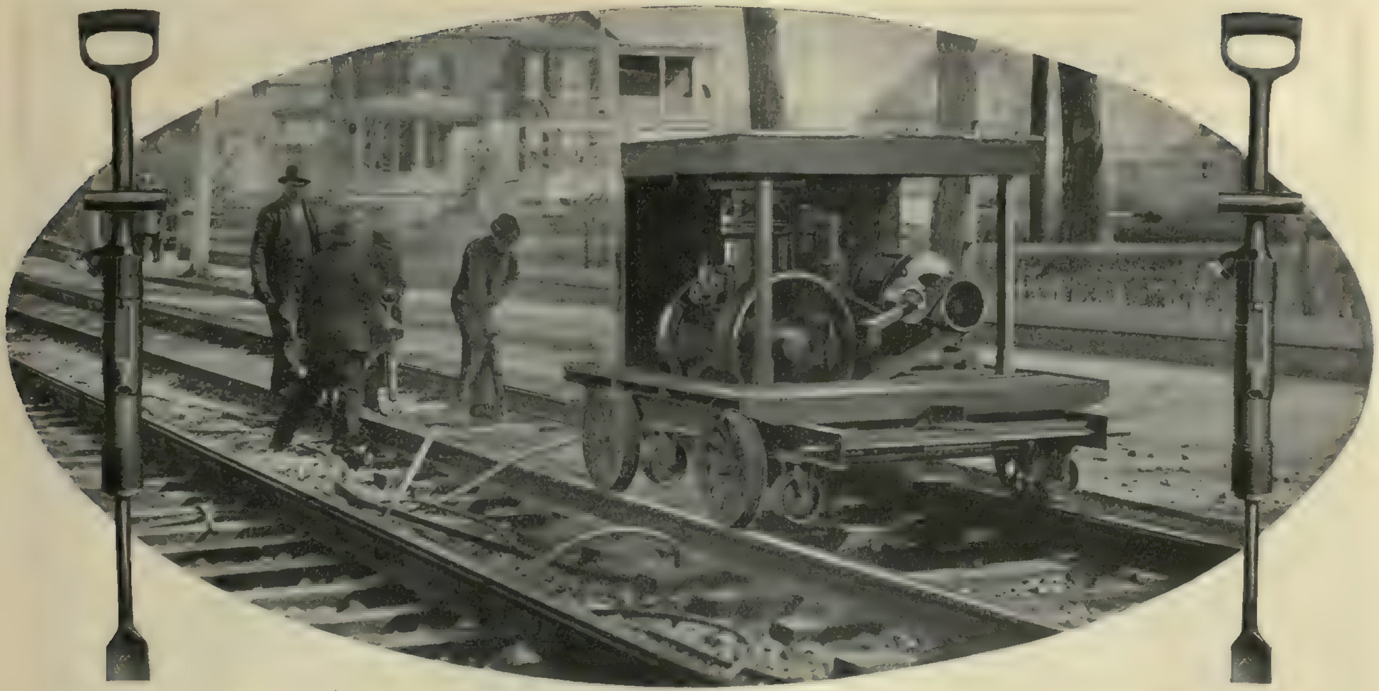
Anchor Webbing Co.
Diamond State Fibre Co.
General Electric Co.
Hope Webbing Co.
Mechanical Rubber Co.
Mica Insulator Co.
Okonite Co.
Packard Electric Co.
Sherwin-Williams Co.
Standard Paint Co.
Standard Underground Cable Co.
Standard Woven Fabric Co.
Westinghouse Elec. & M. Co.



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At work in crushed stone ballast on Liberty Heights Ave., Baltimore

Advantages of "Imperial" Tamping

- Fast Progress
- More even tamping
- Greater stability
- Effective in any ballast
- Less labor required
- Traffic interruption minimized
- Ballasting costs reduced

Ask for Bulletin 9023

TO GET MOST FROM AN "IMPERIAL" TIE TAMPING OUTFIT

You should consider the many uses for pneumatic power in maintenance work and the savings that can be effected.

A few applications:

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Pneumatic grinders for rail joints.
Pneumatic hammers for riveting.
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READY-REFERENCE INDEX

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Rail Grinders. (See Grinders.)

Rails, Relaying.
Zelnicker Supply Co., W. A.

Rail Welding. (See Brazing and Welding Processes.)

Rattan.
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Electric Service Supplies Co.
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Internat'l Register Co., The.
Long Co., E. G.
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TRADE B MARK

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

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Brill Co., The J. G.
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St. Louis Car Co.

Second-Hand Equipment. (See also pages 80-81.)
Archer & Baldwin.
Kerschner Co., Inc., W. R.
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Seating Material. (See also Rattan.)
Brill Co., The J. G.
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Printing begins on Tuesday of each week.

Changes of copy received up to 10 A. M. Monday will appear in the issue of the following week, but no proofs can be submitted for OK before publication.

New Advertisements (not changes of copy) received up to Wednesday noon can appear in the issue of that week, but no proofs can be shown.

If proofs before printing are required, change of copy and copy for new advertisements must be in our hands 10 days in advance of the date of publication.

A

Page
*Ackley & Co., G. S........ C
Ajax Metal Co........ 78
Allis-Chalmers Mfg. Co........ 58
Aluminum Co. of America........ 68
Amer. Brake Shoe & Fdry. Co.. 79
American Car Co........ 93
American Carbon & Battery Co. 77
American Electrical Works........ 52
American Frog & Switch Co........ 70
American Mason S. T. Co........ 75
American Ry. Supply Co........ 74
American Rolling Mill Co........ 27
American Steel & Wire Co........ 69
Anchor Webbing Co........ 72
Anderson Mfg. Co., A. & J. M.. 54
Archbold-Brady Co........ 67
Archer & Baldwin........ 80
Arnold Co., The........ 36
Association of Mfrs. of Chilled Car Wheels........ 43

B

Babcock & Wilcox Co........ 70
Baker, Wm. M........ 27
Baldwin Locomotive Works, The. 51
Bark River Bridge & Cul. Co........ 27
Barrett Company, The........ 87
Bates Expanded Steel Truss Co. 67
Bemis Car Truck Co........ 89
Bonham Recorder Co........ 75
Bonney-Vehslage Tool Co........ 75
Borne, Scrymser Co........ 71
Bound Brook Oil-less Bear. Co.. 42
Bridgeport Brass Co........ 10
Brill Co., The J. G........ 93
*Br. Westinghouse Elec. & Mfg. Co........ D
Buckeye Jack Mfg. Co........ 73
Byllesby & Co., H. M........ 36

C

California Cor. Culvert Co........ 27
Cameron Electrical Mfg. Co........ 72
Canada Ingot & Iron Co., Ltd... 27
Canton Culvert & Silo Co........ 69
Carnegie Steel Co........ 78
Carney & Co., B. J........ 68
Chicago Fuse Mfg. Co........ 74
Chipman Chem. Engr. Co........ 62
Cleveland Armature Works........ 80
Cleveland Fare Box Co........ 75
Cleveland Frog & Crossing Co.. 69
Coal & Iron National Bank........ 76
Coast Culvert & Flume Co........ 27
Coil Mfg. & Repair Co........ 72
Collier, Inc., Barron G........ 48
Columbia M. W. & M. I. Co........ 50
Consolidated Car Fender Co........ 77
Consolidated Car-Heating Co........ 74
Cooper Heater Co., The........ 76
Corrugated Cul. Co........ 27
Creaghead Engineering Co........ 74
Cutter Co........ 72

D

D & W Fuse Co........ 30
Daum, A. F........ 72
Dayton Fare Recorder Co., The. 38
Dearborn Chemical Co........ 70
Delaware Metal Cul. Co........ 27
Diamond State Fibre Co........ 70
*Dick, Kerr & Co., Ltd........ A
Dixie Culvert & Metal Co........ 27
Dixon Crucible Co., Joseph........ 57
Dossert & Co........ 55
Drew Elec. & Mfg. Co........ 14
Drum & Co., A. L........ 36
Duff Manufacturing Co., The... 72
Du Pont Fabrikoid Co........ 61
Du Pont de Nemours & Co., E. I........ 67

E

Page
Eclipse Ry. Supply Co........ 74
Economy Fuse & Mfg. Co........ 53
Edwards Co., Inc., The O. M... 61
Electric Equipment Co........ 80
Electric Railway Equipment Co.. 20
Electric Railway Improve. Co... 25
Electric Railway Journal........ 44
Electric Service Supplies Co........ 11
Electric Storage Battery Co........ 77
Elec'l Testing Laboratories........ 36
Eureka Co........ 63, 76

F

Federal Signal Co........ 68
Ford, Bacon & Davis........ 36
Ford Chain Block & Mfg. Co... 60
"For Sale" Ads........ 80, 81
Frankel Connector Co........ 69

G

Galena-Signal Oil Co........ 46
General Electric Co..34, Back Cover
General Vehicle Co........ 37
Globe Ventilator Co........ 77
Gold Car Heating & Lighting Co. 76
Goldschmidt Thermit Co........ 22, 23
Green Eng'g Co........ 71
Griswold Machine Co., G. M........ 81
Gurney Ball Bearing Co........ 92

H

Hale & Kilburn Co........ 76
Hardesty Mfg. Co., R........ 27
Hartshorn Co., Stewart........ 76
"Help Wanted" Ads........ 81
Holden & White, Inc........ 12, 13
Hope Webbing Co........ 73
Horne Mfg. Co........ 77
Hubbard & Co........ 69
Hunt Co., Inc., C. W........ 70
Hunt & Co., Robert W........ 36

I

Illinois Cor. Culvert Co........ 27
Independence Culvert Co........ 27
Independent Lamp & Wire Co.. 83
Indianapolis Switch & Frog Co.. 28
Ingersoll-Rand Co........ 85
International Creo. & Con. Co.. 68
International Register Co., The.. 39
International Steel Tie Co., The. 7
Iowa Pure Iron Cul. Co........ 27

J

Jackson, D. C. & Wm. B........ 36
Jeandron, W. J........ 63
Jewett Car Co........ 66
Johnson Car Co........ 79
Johnson Fare Box Co........ 41

K

Kentucky Culvert Co........ 27
Kerschner Co., Inc., W. R..49, 89
Keyes Products Co., The........ 32
Kilby Frog & Switch Co........ 70
Kinnear Mfg. Co........ 71
Klein & Sons, Mathias........ 68
Kuhlman Car Co., G. C........ 93

L

Page
Lackawanna Steel Co........ 21
Lee-Arnett Co........ 27
Lincoln Bonding Co........ 56
Lindsley Bros. Co........ 68
Little, Inc., Arthur D........ 36
Lone Star Cul. Co........ 27
Long Co., E. G........ 79
Lyle Cor. Culvert Co........ 27

M

Macallen Co........ 54
McCardell & Co., J. R........ 68
Macdonald Ticket & Ticket Box Co........ 75
McGraw-Hill Book Co., Inc........ 47
MacGovern & Co., Inc........ 80
Mechanical Rubber Co........ 58
Mica Insulator Co........ 73
Michigan Bridge & Pipe Co........ 27
Montana Culvert & Flume Co........ 27
Morgan Crucible Co........ 89
Murphy Iron Works........ 71

N

Nachod Signal Co., Inc........ 55
National Brake Co........ 35
National City Co........ 36
National Railway Appliance Co. 83
National Tube Co........ 68
Nebraska Culvert & Mfg. Co........ 27
Neiler, Rich & Co........ 36
Nelsonville Brick Co........ 70
Nevada Metal Mfg. Co........ 27
New England Metal Cul. Co... 27
New York Switch & Cross. Co.. 69
Niles-Bement-Pond Co........ 72
North-East Metal Mfg. Co........ 27
Northern White Cedar Assn........ 15
Northwestern Sheet & Iron Wks. 27
Norton Co........ 57
Nuttall Co., R. D........ 78

O

O'Neall Co., W. Q........ 27
Ohio Brass Co........ 8, 9
Ohio Corrugated Cul. Co........ 27
Ohmer Fare Register Co........ 40
Okonite Co........ 52
Oxweld Acetylene Co........ 59

P

Packard Electric Co........ 71
Page Woven Wire Fence Co........ 17
Pantasote Co., The........ 29
Pennsylvania Metal Cul. Co........ 27
Perey Mfg. Co., Inc........ 45
Peters & Co., Ltd., G. D........ 76
Philadelphia Holding Co........ 65
"Positions Wanted" Ads........ 81
Power Specialty Co........ 71
Protective Materials Corp........ 24

R

Railway Improvement Co........ 33
Railway Roller Bearing Co........ 66
Railway Track-work Co........ 26
Railway Utility Co........ 74
Ramapo Iron Works........ 69
Republic Creosoting Co........ 16
Richey, Albert S........ 36
Road Supply & Metal Co., The... 27
Roebling's Sons Co., John A........ 68
Roller Lock Nut Co., Inc........ 56
Rooke Automatic Register Co... 75

S

Page
St. Louis Car Company, The........ 66
Safety Car Devices Co........ 5
Samson Cordage Works........ 74
Sanderson & Porter........ 36
Sangamo Electric Co........ 74
Sargent & Lundy........ 36
Scofield Engineering Co........ 36
Searchlight Section........ 80, 81
Second Hand Equip........ 80, 81
Sherwin-Williams Co........ 73
Simmen Automatic Railway Signal Co........ 68
Sioux Falls Metal Cul. Co........ 27
Smith Heater Co., Peter........ 76
Smith-Ward Brake Co........ 64
Spokane Cor. Culvert & Tank Co. 27
Standard Paint Co........ 73
Standard Steel Works Co........ 65
Standard Underground Cable Co. 67
Standard Woven Fabric Co........ 72
Star Brass Works........ 62
Stephenson Co., John........ 93
Stone & Webster Engrg. Corp... 36
Stucki Co., A........ 78

T

Taylor Electric Truck Co........ 64
Tennessee Metal Cul. Co........ 27
Titanium Alloy Mfg. Co........ 91
Trolley Supply Co........ 77
Tubular Woven Fabric Co........ 31

U

Union Spring & Mfg. Co........ 77
Union Switch & Signal Co........ 18
U. S. Electric Signal Co........ 19
Universal Lubricating Co., The.. 77
Universal Safety Tread Co........ 75
Utah Cor. Cul. & Flume Co........ 27

V

Van Dorn Coupler Co........ 77
Van Dorn & Dutton Co........ 78
Virginia Metal Cul. Co........ 27

W

"Want" Ads........ 80, 81
Wason Mfg. Co........ 93
Watson-Stillman Co........ 60
Western Metal Mfg. Co........ 27
Westinghouse Church Kerr & Co., Front Cover
Westinghouse Elec. & Mfg. Co.2, 6
Westinghouse Traction Brake Co. 4
Weston Elec'l Instrument Co... 83
Wheel Truing Brake Shoe Co... 78
White Companies, The J. G........ 36
White Elec'l Supply Co., T. C.. 53
Wisch Service, The P. Edw........ 88
Wood Co., Chas. N........ 68
Woodman Mfg. & Supply Co., R. 75
Woodmansee & Davidson, Inc.. 36
Wyatt Metal Works........ 27

Y

Yale & Towne Mfg. Co........ 59

Z

Zelnicker Supply Co., Walter A. 81

TITANIUM-TREATED RAIL

Saves Money on Curves—
Why Not on Tangents Also?

A logical question—and the Brooklyn Rapid Transit Co. answered it by specifying Titanium-treated for all its tangent track bought for 1914 and 1915.

Comparative tests in other cities, under actual every-day service, show that Titanium-treated rails outwear untreated rails—the average increase of life is over 40%.

More than that—Titanium-treated rails are more ductile—they are safer rails.

"Rail Reports"

will give you some interesting facts—write for a copy.

TITANIUM ALLOY MANUFACTURING COMPANY

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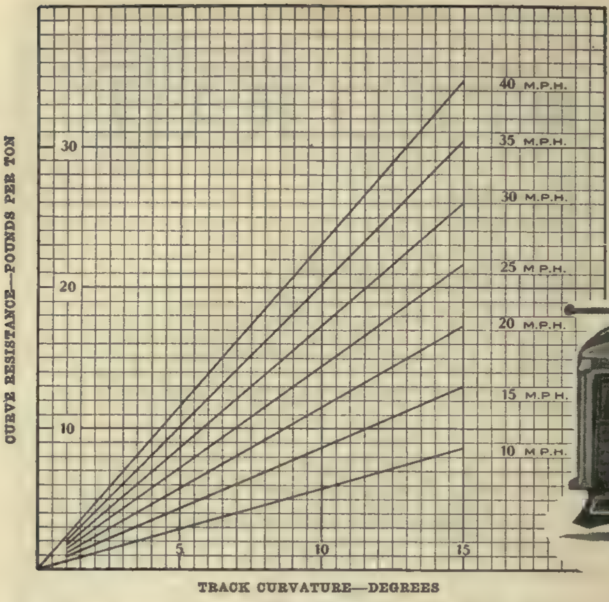


Chart showing results of extensive tests on curve resistance, made by University of Illinois Experiment Station.

Car used in making tests.

How much of this curve resistance will Gurney Ball Bearings eliminate?

Frankly—we don't know, but we do know that if the curve resistance at 10 miles per hour on a 14-degree curve is 8 lbs. per ton, the curve resistance on the short curves in city streets must be something enormous.

We also know that the part of a plain journal that takes the thrust is about as inefficient a type of bearing as can be imagined—poorly lubricated, often hot, almost always worn.

Gurney Radio-Thrust Bearings carry both radial and thrust loads, and carry thrust loads just as easily as radial loads. When carrying either radial or thrust loads they will greatly reduce the friction, and can be depended upon to reduce bearing troubles and maintenance expense to a minimum.

Gurney Ball Bearing Journal Boxes fit all standard trucks. Try them out on one or two cars.

GURNEY BALL BEARING CO.

125 Conrad Patent Licensee

Chicago, Ill. **JAMESTOWN, N. Y.** New York City

BRILL RADIAX TRUCK

It seems rather mysterious that certain small trunnions or pins can let the axles of the Radiax Truck radiate freely on curves and yet instantly be ready to pull the axles back to normal position and constantly keep a powerful force at work to hold the body steady and the wheels from "nosing" on tangents.

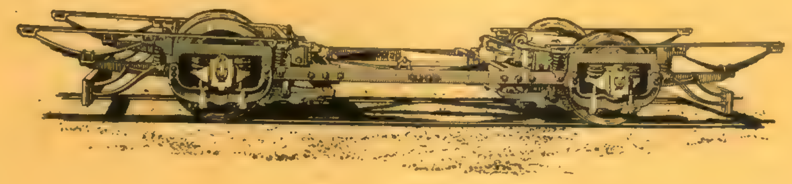
Yet there is nothing really strange about the steadiness of carbodies mounted on Radiax Trucks. It is thru leverage, simply and automatically applied, that the double-trunnions at the lower end of the journal box links stop any tendency of the carbody to swing snake-like along straight stretches of track the instant such tendency starts.

There would be no leverage in favor of stability if the load were swung on single trunnions. It is by using two trunnions and spacing them apart just the right distance that any tilting of the link instantly puts all the weight on one trunnion and throws the suspension of the load out of center; this exerts a powerful leverage to straighten up the link and return the other trunnion to its bearing and hold it there, resulting in a flexible but firm connection between the axles and the rest of the truck with the superimposed carbody.

Thus the cornerwise swinging of the carbody which has always been the drawback to non-rigid-axle trucks has been eliminated from the Radiax by the patented double-trunnion link feature, the real secret of the truck's complete success.

About fifty different railway companies at home and abroad use the Radiax Truck and a large number of these have ordered them a second and a third time.

Bulletin 219 tells the rest of the story.



"Look it up in Brill Magazine"

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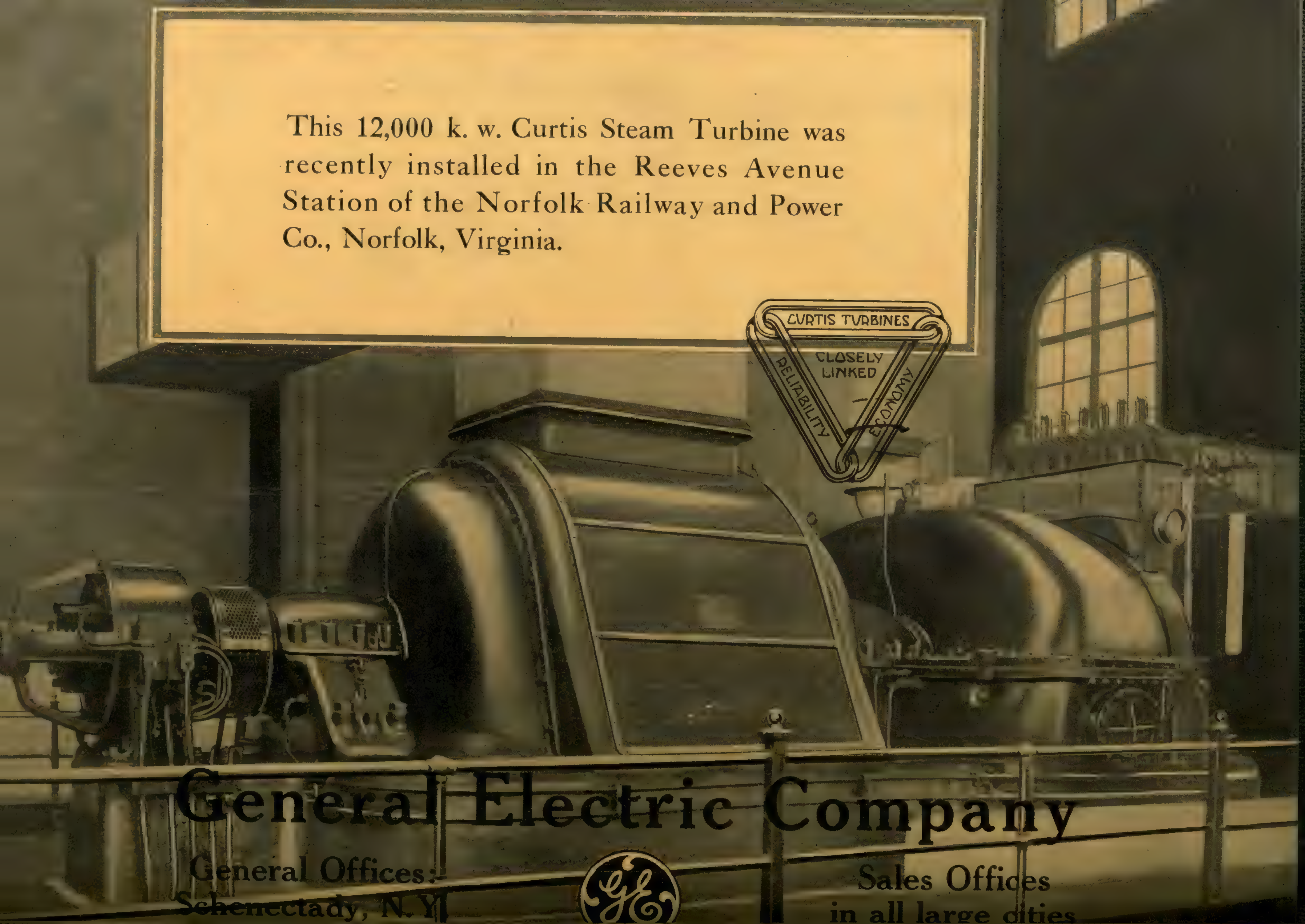

This 12,000 k. w. Curtis Steam Turbine was recently installed in the Reeves Avenue Station of the Norfolk Railway and Power Co., Norfolk, Virginia.

General Electric Company

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Schenectady, N. Y.

Sales Offices
in all large cities

Articles of Interest to the Power Generation and Distribution Engineer

ELECTRIC RAILWAY JOURNAL

New York, May 12, 1917 McGraw-Hill Publishing Co., Inc. Vol. 49, No. 19 10c a copy

The
Screech of the
Curve
is the Call for
TITANIUM

Titanium treatment produces a ductile rail even when high in carbon—

This high ductility of a hard rail, due to uniformity of carbon, phosphorus and sulphur throughout the rail ingot, insures freedom from that breakage frequently experienced with untreated high carbon rails when subjected to severe bending or shock.

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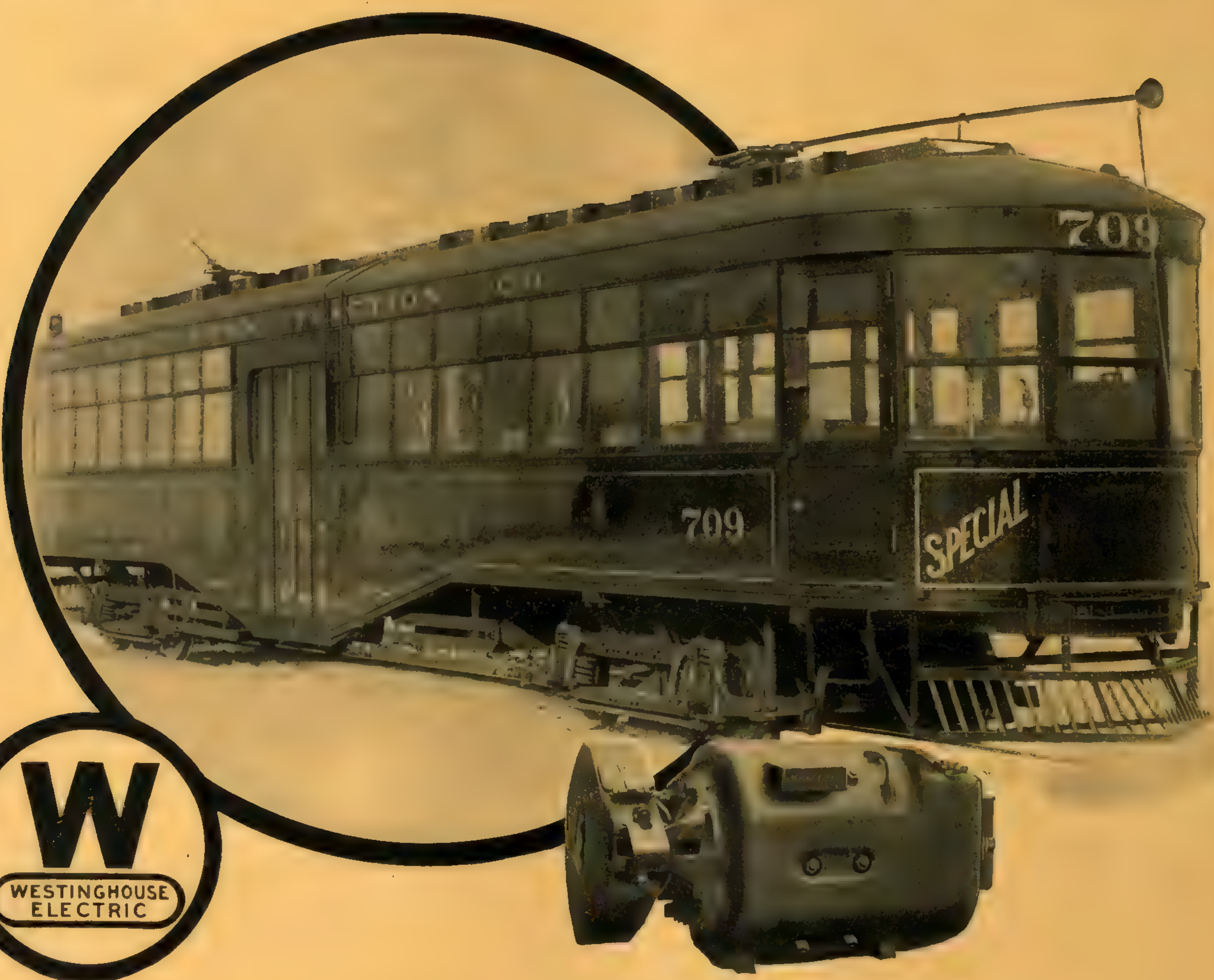
Light Interurban Service



WESTINGHOUSE ELECTRIC

Through The Coke Region

The West Penn Traction Company's modern cars have the most up-to-date Light Interurban Motors.

Westinghouse No. 306 Motors

Cars like the one illustrated traverse the greatest coking region in the United States, in and about Uniontown and Connellsville, Pa. The smoke from thousands of coke ovens is always part of the scenery.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.
Sales Offices in All Large American Cities

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ELECTRIC RAILWAY JOURNAL

VOLUME XLIX, No. 19 NEW YORK, MAY 12, 1917 PAGES 857 TO 902

CONTENTS

Details of Connecticut Company's New Power Plant

The new Grand Avenue plant is being superimposed on the old one without interruption to service. The design has been complicated by market conditions which have made necessary the adaptation of some second-hand equipment ....Page 860

Electric Railways in War Time

Further comments on Canadian activities and experience are presented, together with notes on conditions in the United States, where the movement toward increased agricultural production is growing. Women conductors are being seriously considered in many cases..........Page 866

Extension of London Underground Railway System

Subway equipment with unusual features of body design and electric control is operated over an 8-mile section of the London & North Western Railway tracks to give through service between the suburbs and the center of the city ....Page 871

EQUIPMENT AND ITS MAINTENANCE......876

Getting Rail-Head Contours—*By W. R. Dunham, Jr.*
Valuation of Track Special Work—*By A. R. Bailey.*
Railway Practice in Supplying Commercial Energy—*By F. C. Chambers.*
Low-Floor Multiple-Unit Cars for Boston.
Cost of Erecting Overhead Work—VIII.
Marking Car Switches to Distinguish Circuits—*By C. L. Keller.*
Railings Aid Prepayment Fare Collection in Des Moines Car.
Portable Automatic Substation for Kansas City Railways.
Cupping of Rails at Junctions with Special Work.
Substitute Tie for Heavy Service.

EDITORIALS 857

Higher Fares Are Now Necessary.
Women Conductors a Possibility?
Truck Gardens on Right-of-Way Involve Risk.
The Real American Autocracy.
Selecting Line Insulators.
Retiring the Veteran Power Plants.
Tact Needed in Introducing One-Man Cars.

COMMITTEES OF THE SOUTHWESTERN ASSOCIATION 864

PATRIOTISM AND ACCIDENTS.............864

PRINCIPLES IN COMPUTING DEPRECIATION OF PLANT 865

FORECAST TRAFFIC AT DULUTH, MINN.....865

PROJECTED ELECTRIC TRAMWAY IN AUSTRALIA 865

NEW PLAN OF PENNSYLVANIA RAILROAD TO SECURE HELP 873

COUGH DROP IN THE FARE BOX..........873

MORE REVENUE SOUGHT IN NEW YORK CITY 874

COMMUNICATIONS 875

The Arch-Bar Truck in City Service.

NEWS OF ELECTRIC RAILWAYS 884

Decision in Tacoma Case.
South Bend Men Still Out.
$46,862,972 Fixed as Portland Value.
Public Beginning to Appreciate.
Washington Men File Brief.
Dearth of Help at Cleveland.
District Valuations Announced.
Programs of Association Meetings.

FINANCIAL AND CORPORATE.............889

Purchase Rumors Denied.

TRAFFIC AND TRANSPORTATION...........892

Atlantic City Ordinance Bars Jitneys.
Chicago Surface Traffic Improved.
Mr. Loree Suggests More Revenues.
Seven-Cent Fare Unit Granted.
Safety Work Brings Results.
Business Stimulated by Rehabilitation.

PERSONAL MENTION 895

CONSTRUCTION NEWS 897

MANUFACTURES AND MARKETS 899

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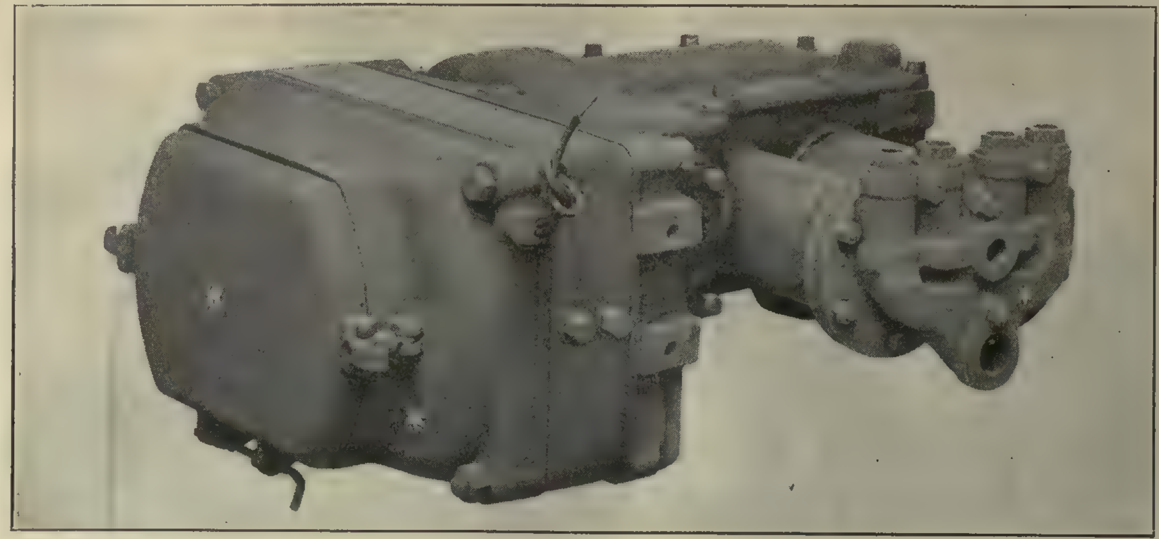
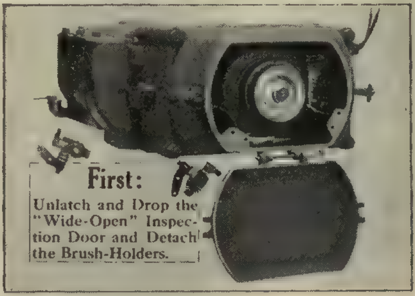


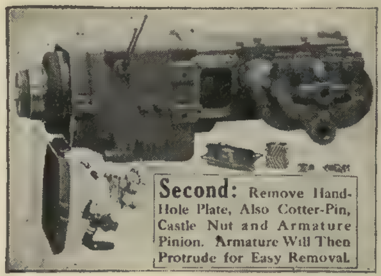
The

Westinghouse "Bungalow"

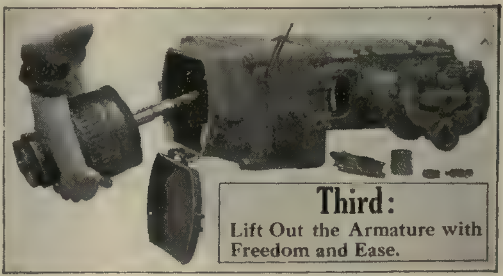
Compressor Offers Easy Removal by One Man of the Armature, Should Same for Any Reason Become Necessary, Without Detaching the Compressor from the Car Body, as follows:



First: Unlatch and Drop the "Wide-Open" Inspection Door and Detach the Brush-Holders.



Second: Remove Hand-Hole Plate, Also Cotter-Pin, Castle Nut and Armature Pinion. Armature Will Then Protrude for Easy Removal.



Third: Lift Out the Armature with Freedom and Ease.

Westinghouse Traction Brake Company

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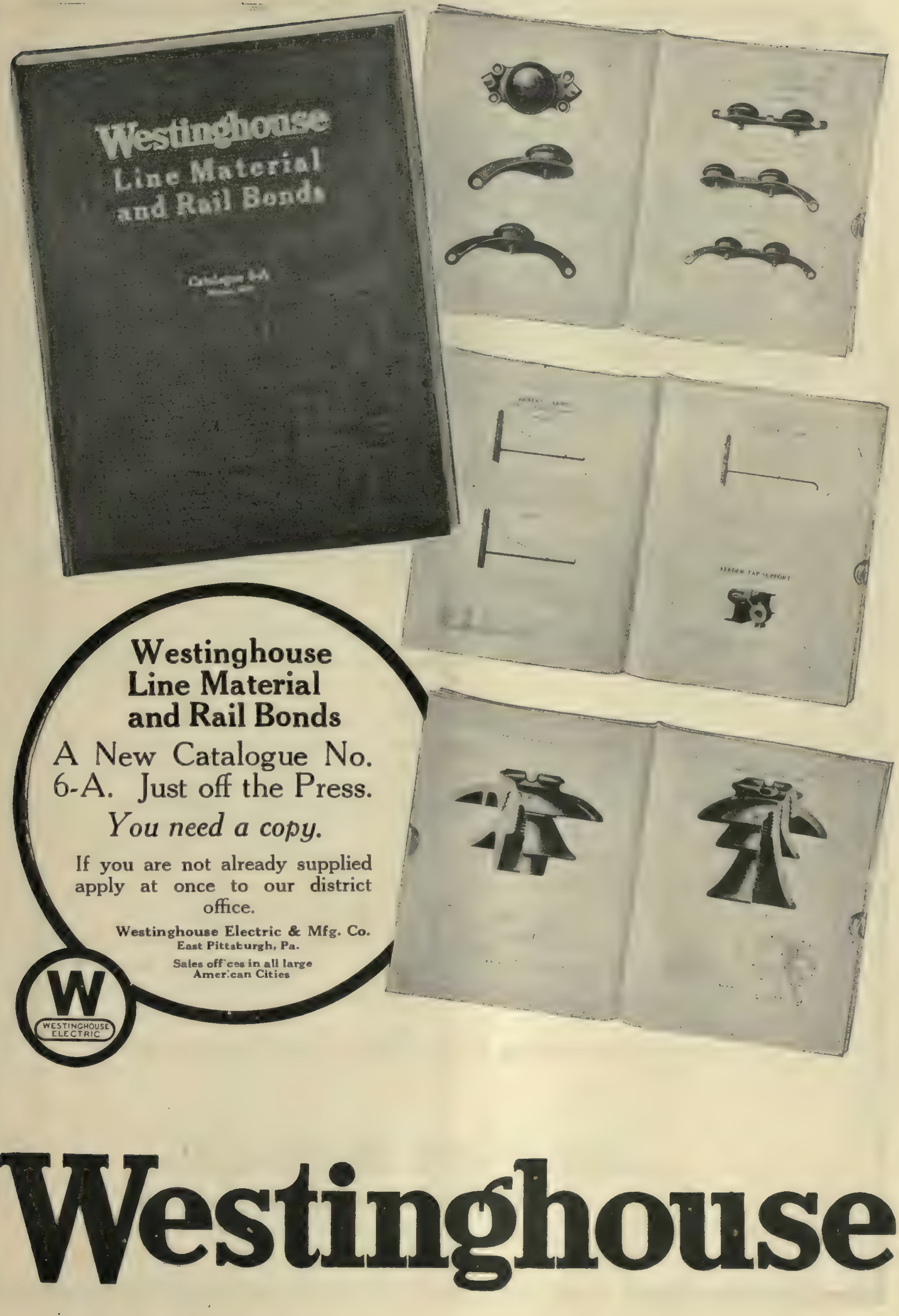


Westinghouse
Line Material
and Rail Bonds

A New Catalogue No. 6-A. Just off the Press.

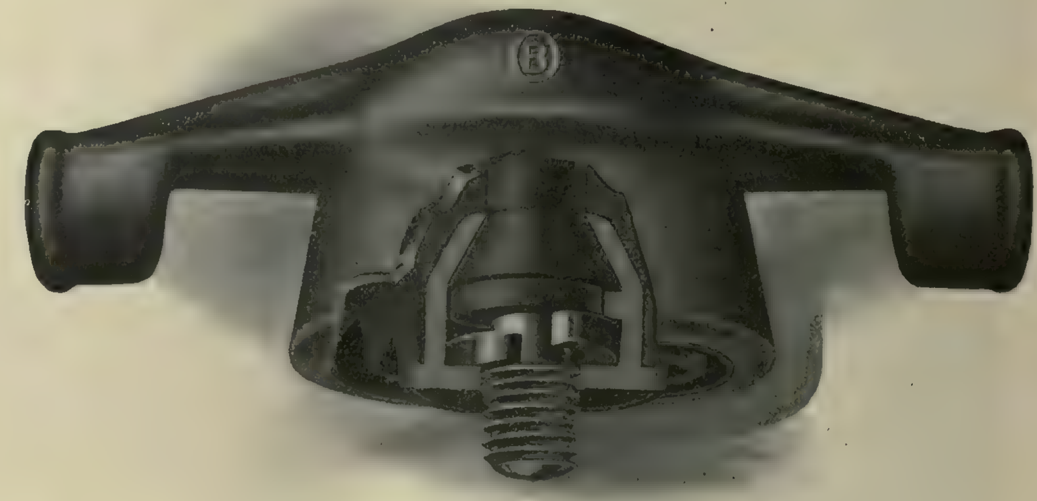
You need a copy.

If you are not already supplied apply at once to our district office.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

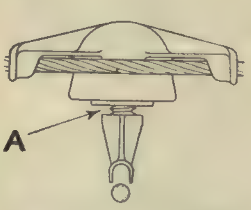
Sales offices in all large American Cities

Westinghouse



O-B Type N Lock Hanger Patented

Forestall Trouble on the Line



Loose joint, as at "A," is avoided with the O-B Lock Hanger

There is a "see-saw" pressure exerted on a trolley ear every time the wheel runs under it. Unless the joint between hanger and ear is tight, moisture will enter, threads may rust and probably will strip under the vibration.

But there is a sure way to prevent this—by using O-B Lock Hangers.

The stud and a heavy lock washer are assembled in a malleable iron shell. This unit is molded into the hanger shell with Dirigo insulation. The stud has a limited vertical movement against the spring of the washer.

In installing, the ear is screwed up until it comes in contact with the bearing surface of the hanger, then turned still further until it aligns with the wire. The joint between hanger and ear is tight and stays tight—a construction which befits a well-planned system.

See catalog No. 16.

The Ohio Brass Co.

Mansfield, Ohio

Crowding Quality into Copper

When a shipment of cable for O-B Rail Bonds comes in, competent, responsible inspectors examine it to make sure that it meets our rigid specifications.

To this pure copper as a start each manufacturing process adds its quota of quality. Quality in the raw material, quality in the development means quality in the finished product.

O-B Compressed Terminal Rail Bonds

then, always have smooth, accurate terminals which make a clean, intimate contact.

And so, always make the track resistance low.

These are provable facts and scores of satisfied users have proved them.

O-B Compressed Terminal Bonds are made in any length or capacity.

Described with other types on pages 466 to 504 of catalog No. 16.

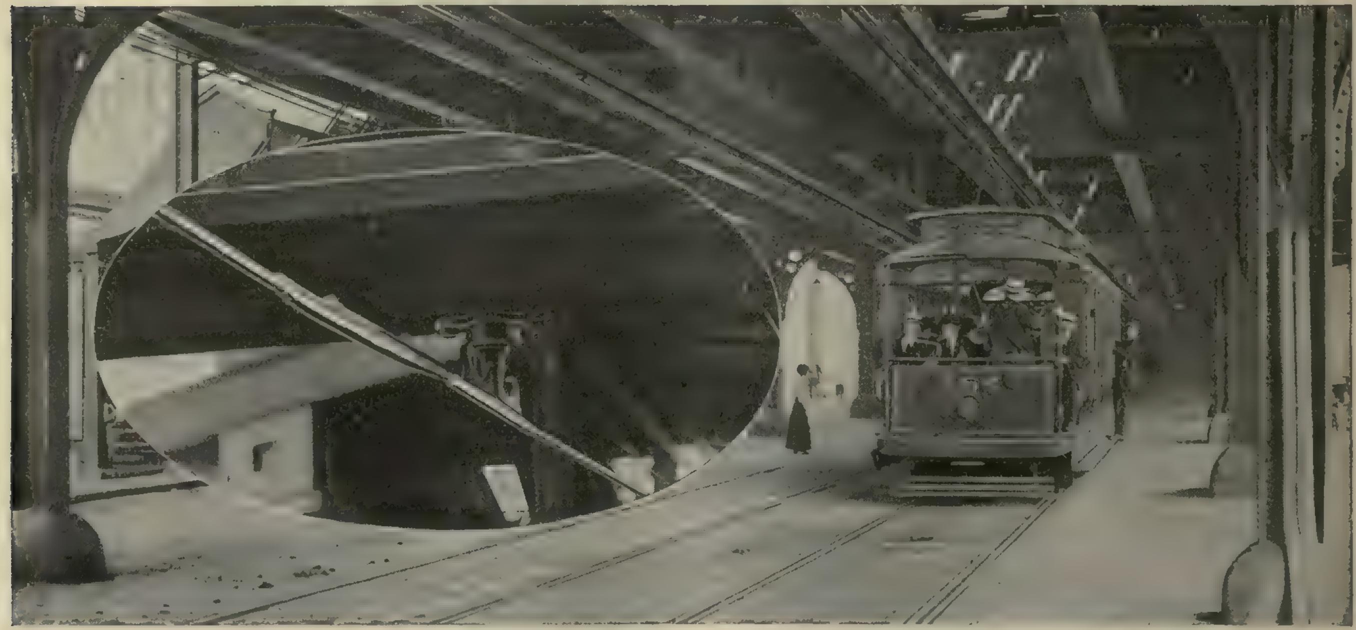
The Ohio Brass Co.

Mansfield, Ohio

B

Phono-Electric

—The Wire of Long Life



Does Your Trolley Wire Allow Forty per cent (40%) Safe Wear?

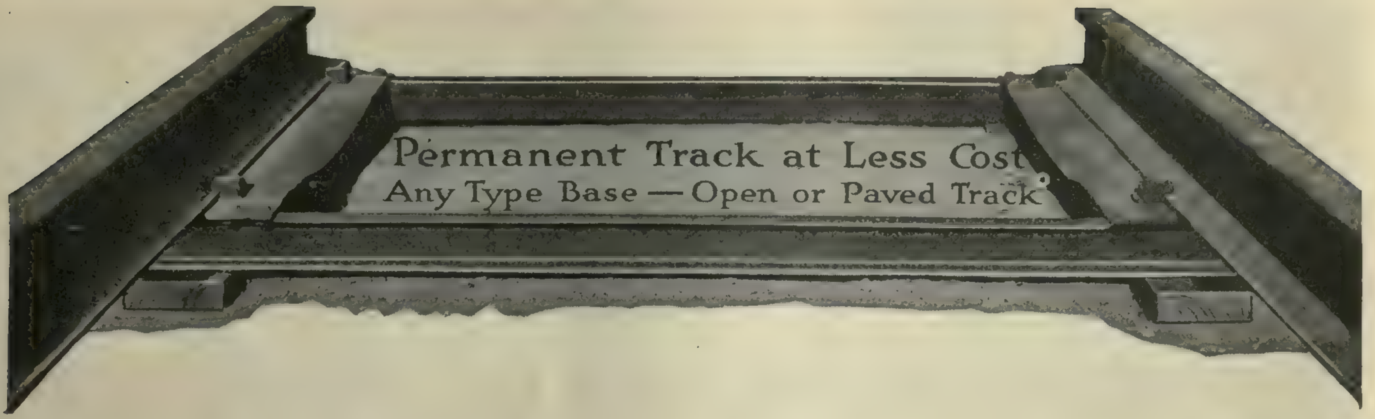
In May and October, 1914, the Union Railway, New York, put up 4 miles more of No. 0000 Phono-Electric Trolley Wire on Westchester Avenue between Third Avenue and Southern Boulevard (because the first half mile, installed on Third Avenue in 1908, had made good most emphatically)—

Here low clearance called for a 14 in. offset (see illustration above) and the car headway was as low as 30 seconds.

The recent calipering of the pioneer ½-mile shows that at least eight years' life may be expected in this service and that this No. 0000 grooved wire can be worn down to 60 per cent of its original diameter with perfect safety. Phono-Electric is a wire without a core of softness.

That's one answer to the question "Does it pay to install Phono-Electric Trolley Wire?"

Bridgeport Brass Company, Bridgeport, Conn.


Permanent Track at Less Cost
Any Type Base — Open or Paved Track

INTERNATIONAL
STEEL TWIN TIES
are the best for bridge tracks

Bridges usually require shallow track foundations, and International Ties meet such conditions admirably.

The over-all depth of the ties is only 3¼ inches, and a concrete foundation of only 3¼ inches is required.

The labor of laying is greatly reduced, because only one-third as many ties are used as in wooden tie track.

Once installed, your ties are permanent and will last as long as the bridge.

Maintenance costs are reduced to the minimum.

If you are interested in permanent track of any kind let us give you all the Steel Twin Tie facts.

The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations
General Sales Office and Works: Cleveland, Ohio

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San Francisco, Cal. Seattle, Wash.
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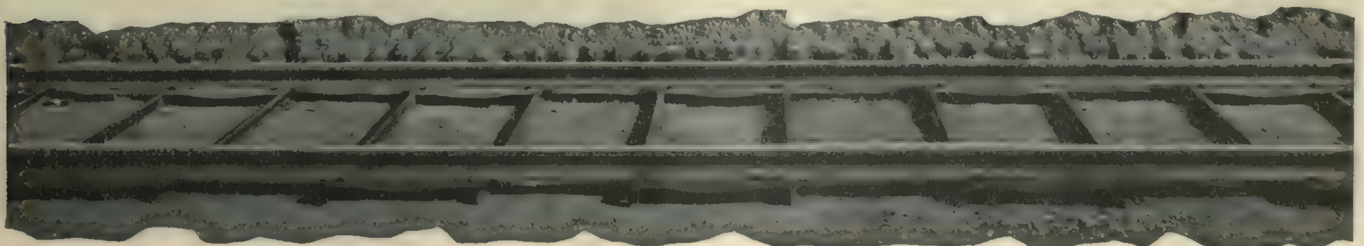


GURN

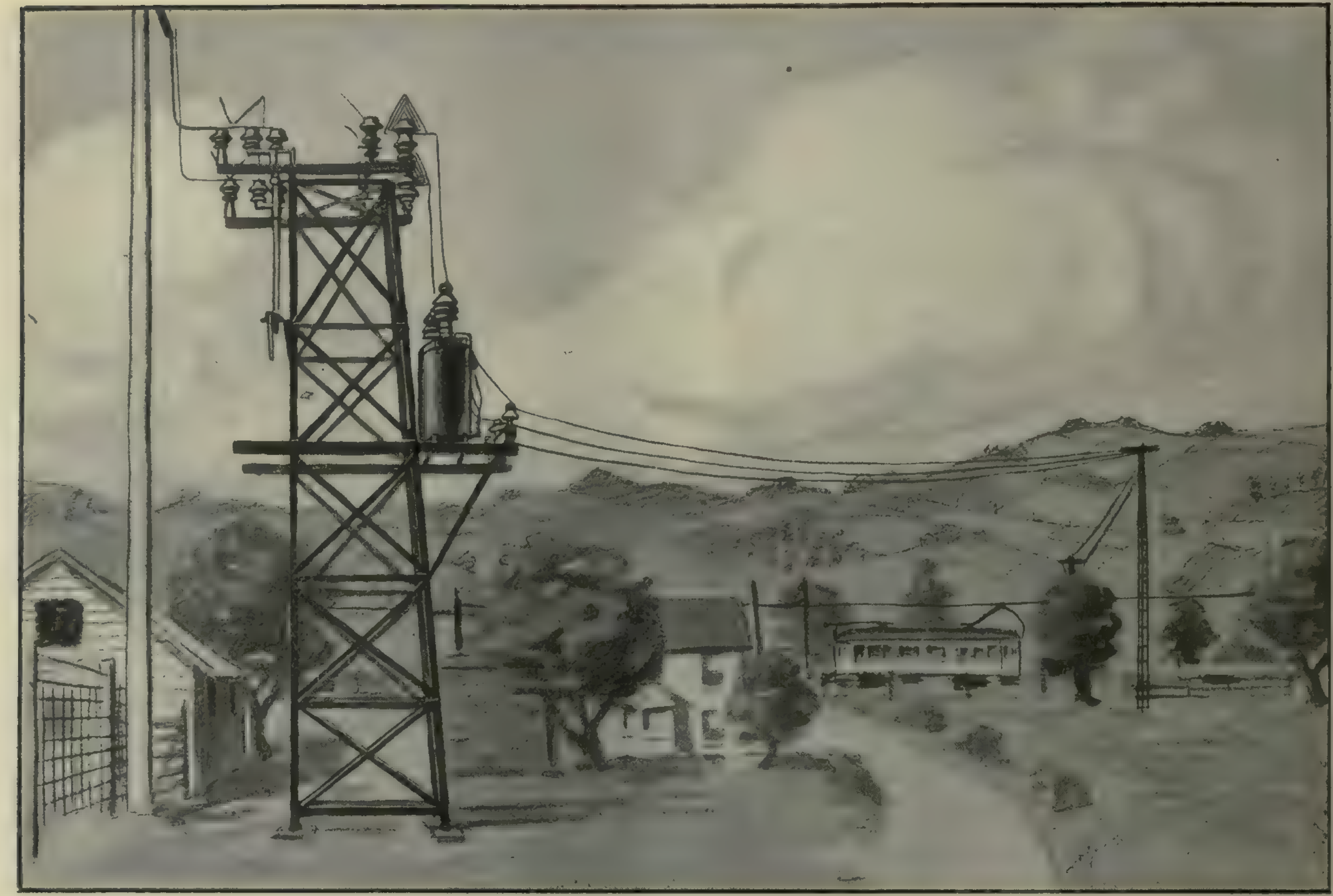
No delicate adjustments on Gurney journal boxes

Because we know that railway men cannot be bothered with boxes that require careful adjustment, we have made Gurney Ball Bearing Journal Boxes so that no adjustments are necessary in installing the box. No matter how tight you turn the nut you cannot cramp the bearings.

The Radio-Thrust Bearings used in Gurney Journal Boxes are the only bearings ever used in journal boxes that have thrust capacity equal to the radial capacity of the bearings. This is why Gurney Bearings make good on cars where other bearings have failed.

The sooner you equip a sample car the sooner you will be convinced. We will furnish bearings only or complete boxes to fit your trucks. Send us the weight and speed of the car and the number of the truck.

Gurney Ball Bearing Company
Conrad Patent Licensee
Chicago, Ill. Jamestown, N. Y. New York City



We Can Help Interurban Railways to Sell Power

If you are one of hundreds of suburban and interurban railways which have a poor load factor because of long headways, you have **every** reason to take up the sale of power.

Since the bulk of your tributary population is close to your right-of-way, you can supply all their electrical needs far more cheaply than a central station or hydroelectric distribution system.

We are specialists in outdoor substations, disconnecting switches, lightning arresters and other apparatus required, both for railway distribution and power sales distribution.

Your inquiries on how to develop power revenue will be welcomed.

Railway and Industrial Engineering Co.

PITTSBURGH, PA.

Did You Get Your Copy of This Book?

It tells you why "Golden Glow" light is best.

It illustrates many new types of "Golden Glow" Headlights.

It shows new types of main and dimming resistances.

It illustrates the use of flood-lighting projectors on work cars.

It contains 64 pages—all full of interesting information on "Golden Glow" Headlights.

This book is being mailed to railway officials generally
—if by error you do not receive your copy, write us.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

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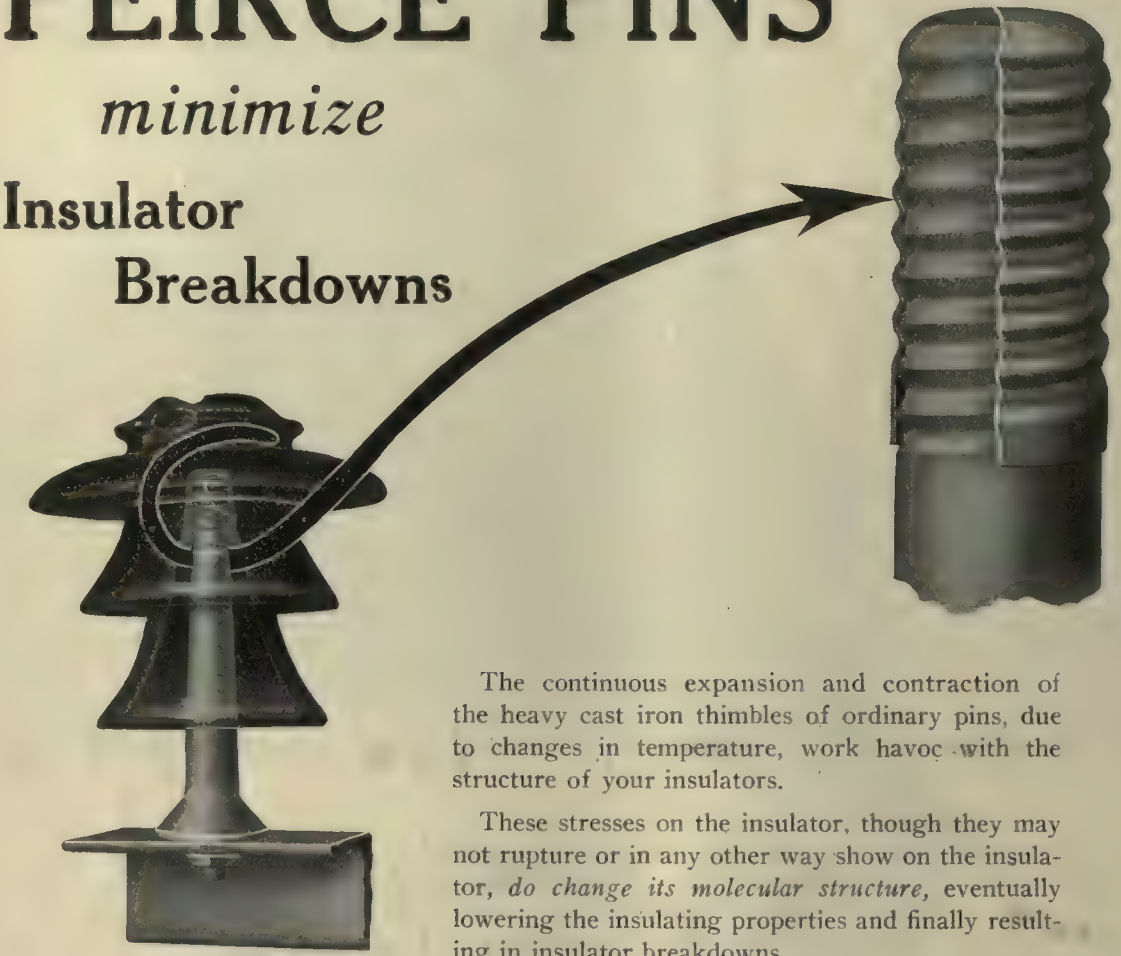
PEIRCE PINS

minimize

Insulator Breakdowns



The continuous expansion and contraction of the heavy cast iron thimbles of ordinary pins, due to changes in temperature, work havoc with the structure of your insulators.

These stresses on the insulator, though they may not rupture or in any other way show on the insulator, *do change its molecular structure,* eventually lowering the insulating properties and finally resulting in insulator breakdowns.

Peirce Forged Steel Pins

have been designed to take care of this expansion by incorporating the "drawn steel thimble."

The threads of the thimble fit loosely over the threads of the pin, and a thin cork disc is provided between the top of the pin and the cap of the thimble, to insure a secure fit between insulator and pin. Under expansion the pin simply rides up further on the thimble, the cork disc compressing.

Peirce pins are guaranteed to stand strains equal to their rated strength with a deflection of less than 10 degrees, and without danger to the insulator.

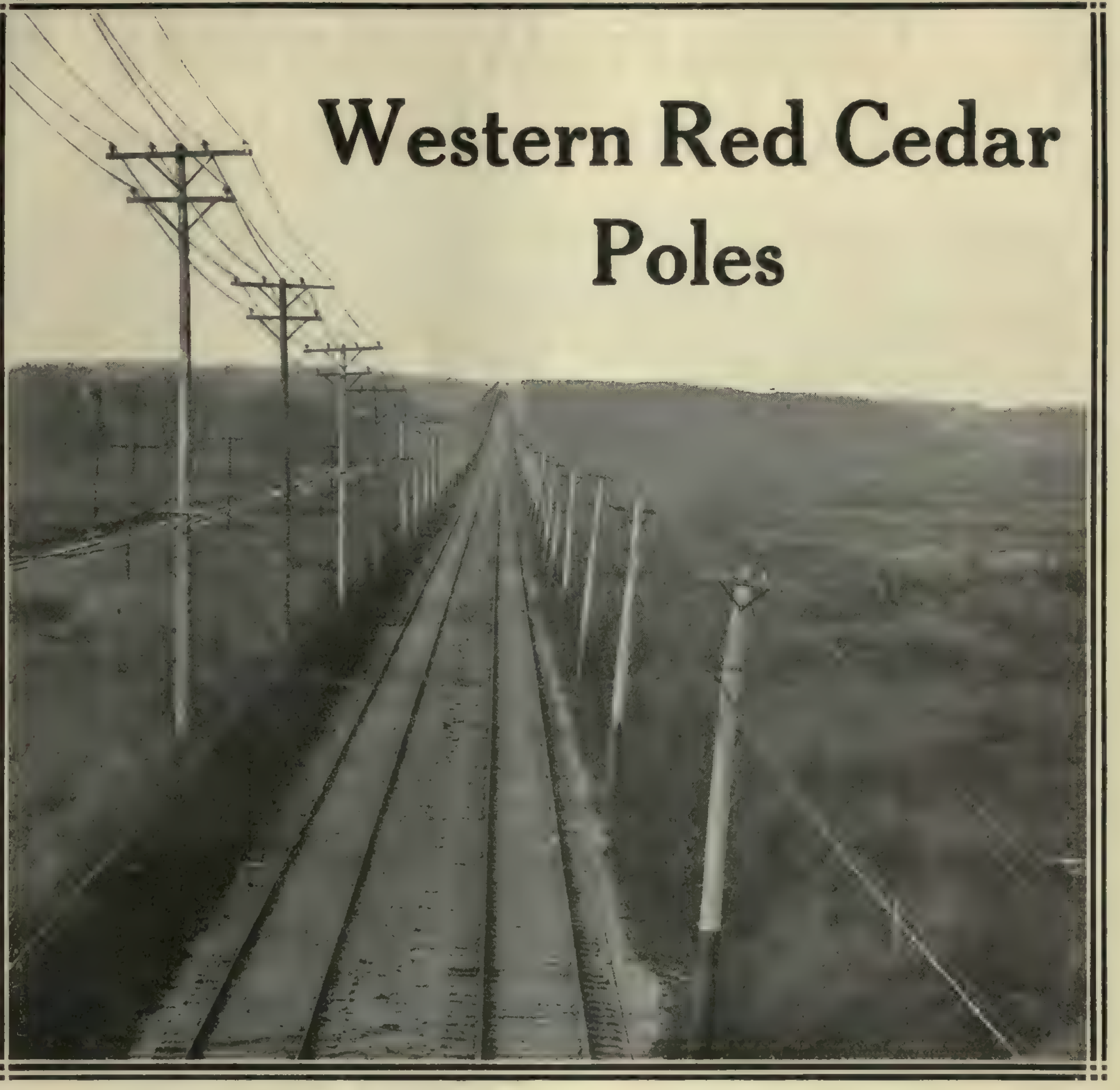
Our booklet tells about "Continuity—and How" to obtain it. Send for a copy.

The Hardware MAKES the Line — Hubbard makes THE Hardware

HUBBARD AND COMPANY

PITTSBURGH

Western Red Cedar Poles



View along lines of the Milwaukee-Waukesha Electric Railway. The tall Western Red Cedar Poles at the left were set in 1909. The shorter Western Red Cedar Poles atthe right were set a few years later.

The Milwaukee-Waukesha Electric Railway is but one of many in this country and Canada which are getting highly satisfactory service from **Western Red Cedar Poles.**

From the Mexican border to Quebec, from California to New England, these strong, straight, beautiful poles are growing steadily in favor among builders of trolley and transmission lines.

The demand for **Western Red Cedar Poles** is also steadily increasing in those sections of the south and east which are much nearer the producing districts of other pole timbers.

The reason is that **Western Red Cedar Poles** outlast those other poles. They are more sightly; easier to handle, transport and erect; and the cost is less.

Ask for poles sold under the strict specifications of the Western Red Cedar Association.

The Universal Poles for Universal Service

Western Red Cedar Association, Peyton Building
Spokane, Wash.

Columbia Woodwork and Pattern Facilities

Metal and composition materials are predominant in building modern cars, but you'll need plenty of wood for older cars for years to come.

We have a complete mill room to make up anything you need in the way of sash framing, vestibule framing, doors, etc.

Also anything you want in the pattern line, in brushholder yokes, in composite wood and steel gear cases, etc.

Just think of what an ideal railway shop could turn out, and you have one angle on what Columbia facilities can do for you.

Here are some Columbia-made specialties conveniently listed:

TOOLS

Armature and Axle Straighteners
Armature shaft straighteners
Armature buggies and stands
Babbitting molds
Banding and heading machines
Car hoists
Car replacers
Coil taping machines for armature leads
Coil winding machines
Pinion pullers
Pit jacks
Signal or target switches
Tension stands

CAR EQUIPMENT

Armature and Axle Bearings
Armature and field coils
Bearings (Axle and Armature)
Brush-holders and brush-holder springs
Brake, door and other handles
Brake forgings, riggings, etc.
Car trimmings
Commutators
Controller handles
Forgings of all kinds
Gear cases (steel or mall. iron)
Grid resistors
Third-rail shoe beams and accessories
Trolley poles (steel) and wheels

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St., Brooklyn, N. Y.

W. R. Kerschner Co., Inc., N. Y.   Holden & White, Inc., Chicago   F. F. Bodler, San Francisco

Ten Years in the Ground—In Perfect Condition

This "Armco" Iron Culvert 36 inches in diameter and 20 feet long was installed in 1906, in Hill County, Montana. On account of change in road it was taken up and found to be in perfect condition. Mr. Joseph Berthlote, the County Commissioner, is standing beside it.

ARMCO IRON
Resists Rust

This Is the Verdict of Experience

Where metal products are exposed to the atmosphere or buried in the earth, their material should be standard high-purity iron—"Armco" Iron.

The qualities that made the iron of a hundred years ago far more durable than modern steel produce exactly the same results today.

They are Purity, Evenness and Density.

In these respects "Armco" Iron is the nearest approach to perfection that is commercially available. It is The Iron That's Made To Last.

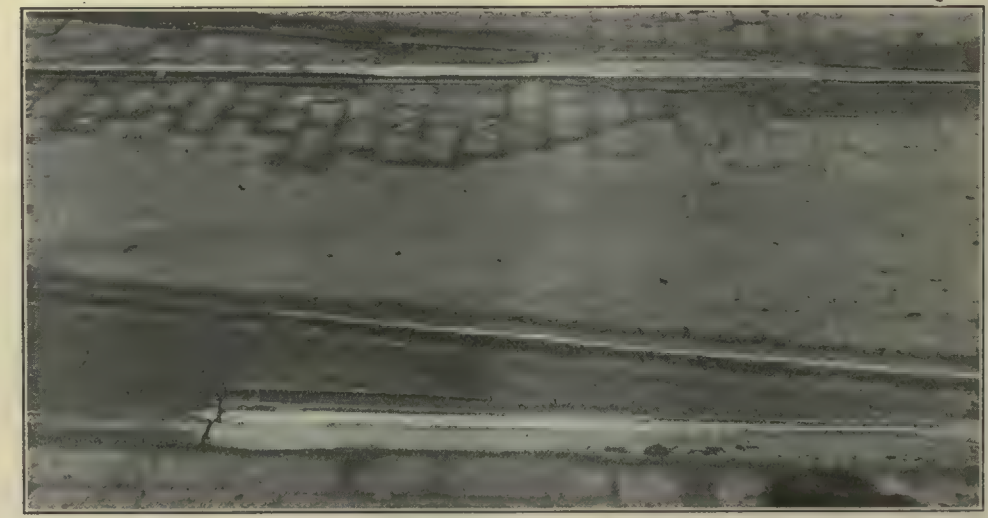
"Armco" (American Ingot) Iron is the logical material for Roofs, Pipes, Culverts, Flumes, Signs, and exposed metal installations in general.

Write the nearest Manufacturer for information and prices on "Armco" (American Ingot) Iron Culverts, Siphons, Flumes, Sheets, Roofing and Formed Products.

Arkansas, Little Rock
Dixie Culvert & Metal Co.
California, Los Angeles
California Cor. Culvert Co.
California, West Berkeley
California Cor. Culvert Co.
Colorado, Denver
R. Hardesty Mfg. Co.
Delaware, Clayton
Delaware Metal Culvert Co.
Florida, Jacksonville
Dixie Culvert & Metal Co.
Georgia, Atlanta
Dixie Culvert & Metal Co.
Illinois, Springfield
Illinois Corrugated Metal Co.
Indiana, Crawfordsville
W. Q. O'Neall Co.
Iowa, Des Moines
Iowa Pure Iron Culvert Co.
Iowa, Independence
Independence Culvert Co.
Kansas, Topeka
The Road Supply & Metal Co.
Kentucky, Louisville
Kentucky Culvert Co.
Louisiana, New Orleans
Dixie Culvert & Metal Co.
Maryland, Munsey Bldg., Baltimore
Wm. M. Baker.
Massachusetts, Palmer
New England Metal Cul. Co.
Michigan, Bark River
Bark River Bridge & Cul. Co.
Michigan, Lansing
Michigan Bridge & Pipe Co.
Minnesota, Minneapolis
Lyle Corrugated Culvert Co.
Minnesota, Lyle
Lyle Corrugated Culvert Co.
Missouri, Moberly
Corrugated Culvert Co.
Montana, Missoula
Montana Culvert & Flume Co.
Nebraska, Lincoln
Lee-Arnett Co.
Nebraska, Wahoo
Nebraska Culvert & Mfg. Co.
Nevada, Reno
Nevada Metal Mfg. Co.
New Hampshire, Nashua
North-East Metal Culvert Co.
New Jersey, Flemington
Pennsylvania Metal Culvert Co.
New York, Auburn
Pennsylvania Metal Culvert Co.
North Dakota, Wahpeton
Northwestern Sheet & Iron Wks.
Ohio, Middletown
The Ohio Corrugated Culvert Co.
American Rolling Mill Co.
Oklahoma, Shawnee
Dixie Culvert & Metal Co.
Oregon, Portland
Coast Culvert & Flume Co.
Pennsylvania, Warren
Pennsylvania Metal Culvert Co.
South Dakota, Sioux Falls
Sioux Falls Metal Culvert Co.
Tennessee, Nashville
Tennessee Metal Culvert Co.
Texas, Dallas
Wyatt Metal Works.
Texas, El Paso
Western Metal Mfg. Co.
Texas, Houston
Lone Star Culvert Co.
Utah, Woods Cross
Utah Corrugated Cul. & Flume Co.
Virginia, Roanoke
Virginia Metal Culvert Co.
Washington, Spokane
Spokane Cor. Culvert & Tank Co.
Wisconsin, Eau Claire
Bark River Bridge & Culvert Co.

Canada—Canada Ingot Iron Co., Ltd., Guelph, Sherbrooke, Winnipeg, Calgary

With Track Like This



you are paying for a
Reciprocating Track Grinder
whether you buy it or not

When cupping, corrugations or indentations **begin** to show in the rails—that's the time to get a Reciprocating Grinder at work.

Bad track conditions never cure themselves. They just keep on getting worse unless they are taken in hand vigorously and given thorough treatment.

And the worse they get the more expensive they are to remedy when the remedy is eventually applied.

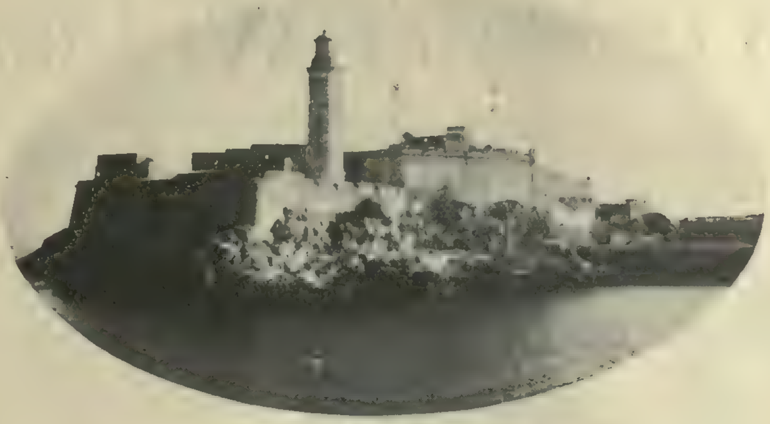
If corrugations and cupped joints are permitted to "take care of themselves," they grow steadily deeper under the impact of the car wheels. Instead of it being an easy and expeditious matter to grind the rail to a smooth condition it requires much more labor and time and necessarily demands **the removal of more of the wearing surface** than would have been the case if grinding were done promptly upon the first appearance of trouble.

When rails need grinding every month of delay simply **adds** to the ultimate expense.

Let us prove to you on your own tracks what an economical adjunct to maintenance a Reciprocating Grinder is.

Railway Track-work Co.

30th and Walnut Streets, Philadelphia, U. S. A.



Castle Morro, Havana

LINCOLN Bonding System

On the Interurban Lines of Havana

The Havana Central Railways was one of the first electric railways outside of the United States to appreciate the merits of the Lincoln System of Bond Welding.

Two of the accompanying illustrations show Lincoln bonds being applied to 70 to 85-lb. rail near the Havana Central station by means of the

One-Man Lincoln Cart

Several repeat orders have recently been received from this Cuban company—ample evidence that the remarkable speed and economy of the Lincoln motor-generator bond-welding system have not been exaggerated.

Lincoln outfits, equipped with an extra control panel, are just as efficient for miscellaneous shop welding and repairs as for bonding.

A true Integral Weld made in the shortest time at minimum cost and without resistance losses

THE LINCOLN BONDING CO.
636 Huron Road CLEVELAND, OHIO

Lincoln Bonder at Havana Central Station

AGENTS

LEWIS & ROTH COMPANY, 1012 Liberty Building, Philadelphia, Pa. 114 Liberty Street, New York City, New York.

CHARLES N. WOOD COMPANY, 14 Federal Street, Boston, Mass.

W. C. BURDICK, 808 First National Bank Building, Milwaukee, Wis.

HOLDEN & WHITE, Inc., 343 S. Dearborn St., Chicago, Ill.

The Erico Portable Welder

Will Please the Transportation Department as Much as the Electrical Department

For it will eliminate all complaints due to the blockade of live operating tracks. The Electrical Department will be equally well pleased to have a means of obtaining a welded bond with a small portable apparatus.

The ERICO outfit consists of a rheostat, weighing 200 pounds, and a welder, weighing 65 pounds, with any mounting or cart required by customer.

The actual operation of welding the bond is accomplished by bringing a hot graphite plate up against the bond terminal, thus eliminating all injury to steel or bond, which might be caused by an arc or flame.

The ERICO PORTABLE WELDER is used to install standard ERICO Rail Bonds, and the completed bond on the rail is identical with that produced by the well-known ERICO BONDING CARS.

ERICO

THE LINE OF LEAST RESISTANCE

The Electric Railway Improvement Co.

Cleveland

Hale & Kilburn

Drawn Steel Pedestal Bases

Pressed steel seat framing originated by Hale & Kilburn ten years ago is now common practice, but Hale & Kilburn still lead in the quality and design of pressed steel parts.

A typical proof is afforded by examining the Hale & Kilburn oval base for seat pedestals—the only base

Drawn from Flat Sheet

and without any seam or weld at side. This single feature, obtained at a cost of many thousands of dollars, but without adding to the price of Hale & Kilburn seats, assures:

Absolutely true and neat outlines.
Maximum strength for minimum weight.
Prevention of dust accumulation and easier cleaning of the floor beneath.
Avoidance of weaknesses due to defective welding.
No obstruction to underseat baggage due to shape of pedestal.

There are many other examples of Hale & Kilburn superiority. Ask us about them.

Pioneers in Steel Trim for Passenger Cars, including interior finish, steel doors, etc.

HK WALKOVER
COPYRIGHTED

Hale and Kilburn Co.

Philadelphia New York Chicago
Washington Atlanta San Francisco

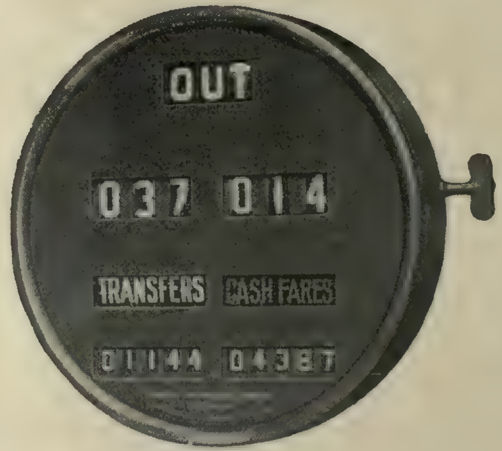
HK WALKOVER
COPYRIGHTED

If you are
in the market
for any kind of a

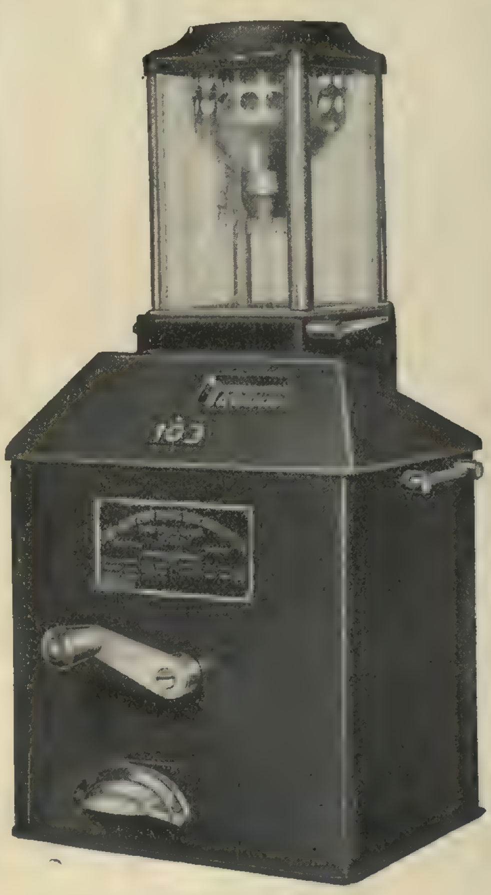
Recorder

FARE COLLECTION SYSTEM

Write us for
Catalog and
information



Sterling No. 16



Dayton No. 101

We devote our entire time to the manufacture of a complete line of:

- REGISTERING and NON-REGISTERING FARE BOXES
- CASH and TICKET FARE BOXES
- STERLING SINGLE and DOUBLE FARE REGISTERS
- CLASSIFIED, INDICATING and PRINTING FARE RECORDERS

for city and suburban cars.

GUARANTEED PERFECT in design, material and construction, and UNEQUALED for accuracy, reliability, and low maintenance cost.

The Dayton Fare Recorder Co.
Dayton, Ohio, U. S. A.

National Pneumatic Manual Door Devices are Promoting Safety and Protecting Schedules on the Liberty Bell Route

The Lehigh Valley Transit Co. made many severe tests before ordering this equipment for the twelve new Southern all-steel center-entrance interurbans which they have recently put in service.

The National Manual Equipment used on these cars is helping to solve traffic-handling problems in large and small cities, and in city, suburban and interurban work.

The selection of this equipment for such high-class service as that of the Lehigh Valley Transit Co. calls for no comment from us.

NATIONAL PNEUMATIC COMPANY

50 Church St. New York

515 Laflin St. Chicago

Even Copper Zone Fares Are Provided For

FARE RECORDER MOUNTED ON CENTER BULKHEAD OF INTERURBAN CAR

THE Bonham Traffic Recorder produces rapidly, simply and accurately a permanent record showing:—

The "on" and "off" points of each passenger.

The mileage traveled by each passenger.

The classification of each fare and the amount of each cash fare.

The date, train number and division.

The total passengers.

The total cash passengers.

If you are planning to get a fairer return from your passengers by working out a copper zone system of fare charges and collection you will find that an instrument ideal for this purpose has been developed. This instrument is the

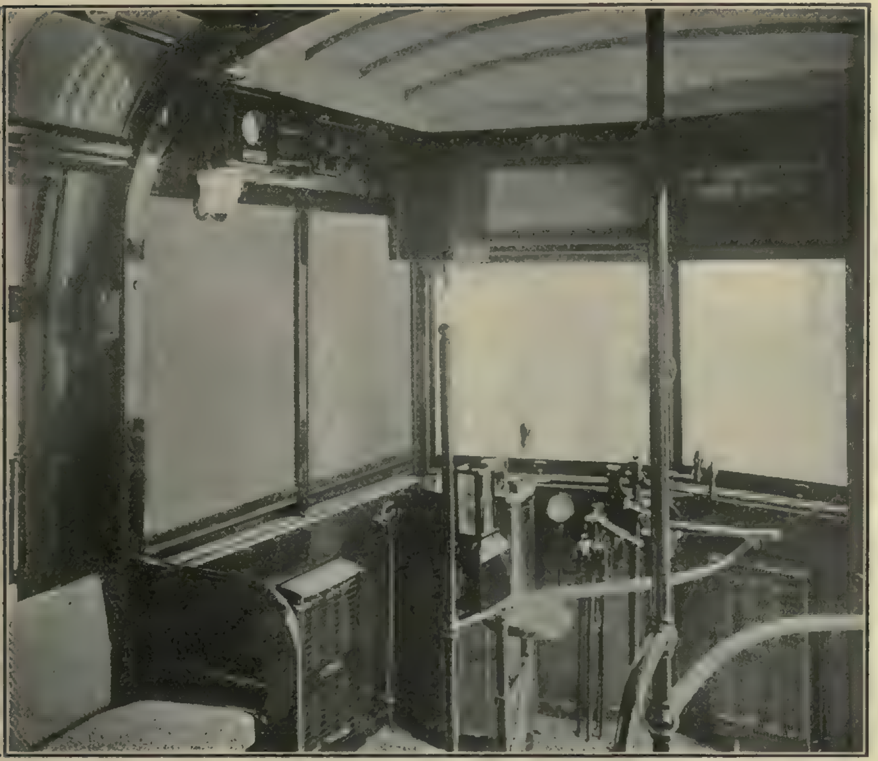
BONHAM TRAFFIC RECORDER

which is efficient for keeping accurate records of every class of traffic. It shows you between what points each passenger travels, what fare he paid and how many miles he rode. By means of the record furnished the auditing department gets accurate train earnings and accurate earnings per passenger mile.

The Bonham Traffic Recorder is not an experiment. It is a fact. Let us give you details of what it is accomplishing in every-day service.

THE BONHAM RECORDER CO.

Hamilton, Ohio, U. S. A.

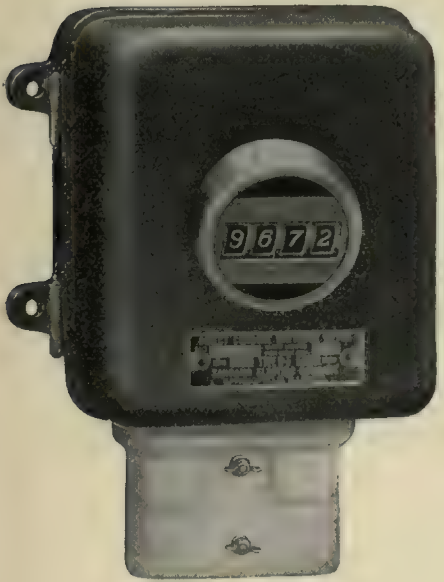


Charlottesville's Preliminary Saving with

ECONOMY METERS

0.3 Cent Per Car Mile

The Charlottesville & Albemarle Railway has scarcely begun to use



Economy Meters

yet a comparison of the power-house records for February, 1916, with February, 1917, shows that the cost of energy charged against electric railway operation was reduced from 4.5 cents to 4.2 cents per car mile, although no special Economy educational campaign had been inaugurated.

At 0.3 cents per car mile saved, the charge for energy for 16,772 car miles was $50.32 less than for the same month in the previous year. At this rate, the meters will pay for themselves within four or five months.

With "Economy" meters and the Economy Educational Campaign, you have nothing to lose and all to gain.

ECONOMY
SANGAMO
BUILT LIKE A WATCH
METERS

Sangamo Electric Company
Springfield, Illinois

Specialists in Meters for Every Electrical Need

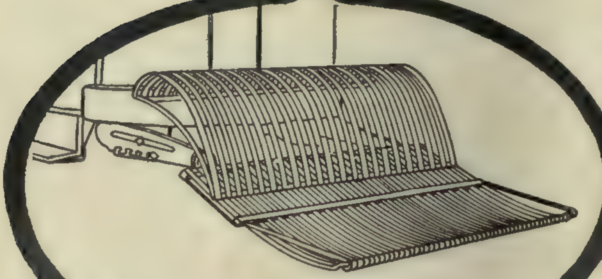
The Indices of
EQUIPMENT EFFICIENCY

Right out in front, the first thing the observer is bound to see on a car is the fender or guard.

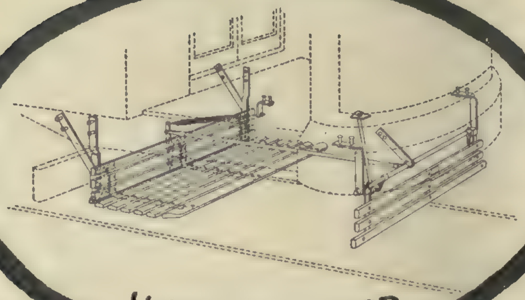
Then the eye involuntarily follows to what is behind the fender, for fenders and guards are the natural indices of equipment efficiency—

Since they cost so little and yet mean so much to safety in operation.

It surely is significant that on so many properties where equipment standards are high, the front end of every car carries either an



PROVIDENCE FENDER



H-B- LIFE GUARD

H-B Life Guard
or
Providence Fender

Two sure indices of equipment efficiency and of regard for "Safety First."

The Consolidated Car Fender Co., Providence, R. I.

General Sales Agents:
Wendell & MacDuffie Co., 61 Broadway, N. Y.

HESS-BRIGHT BALL BEARINGS

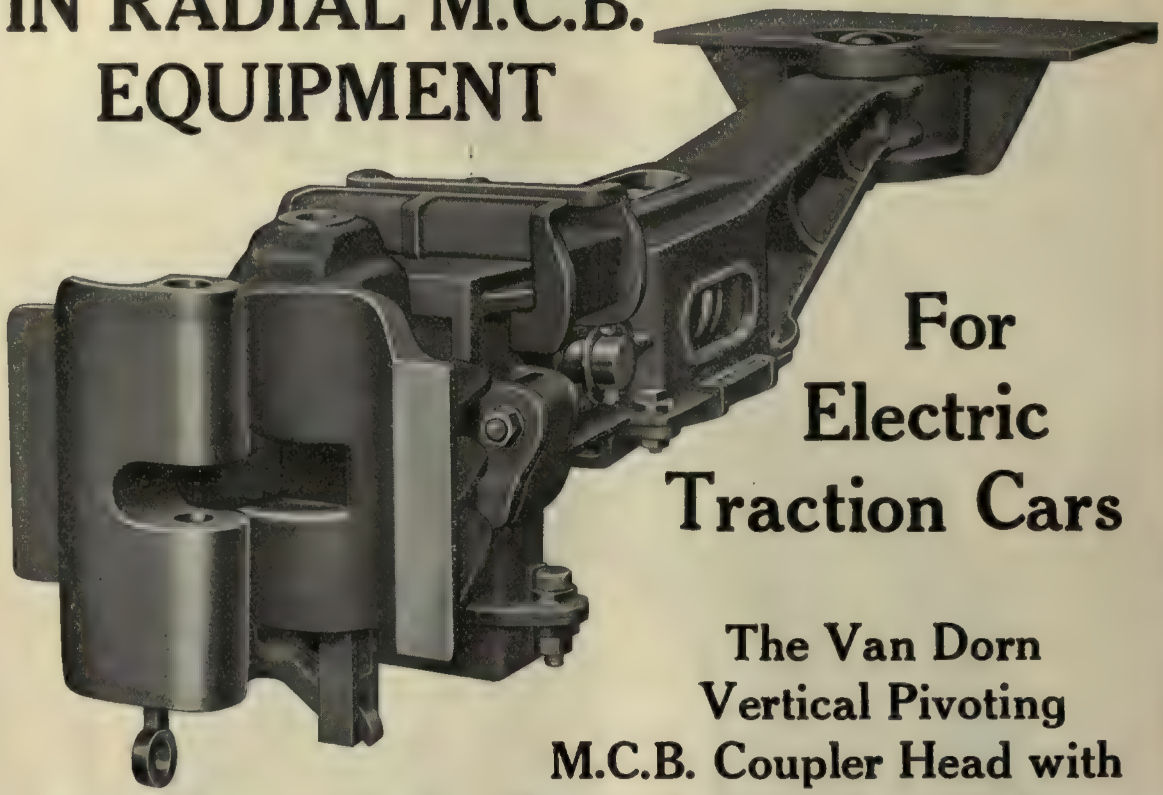
and MAINTENANCE

Hess-Bright Ball Bearings have been lasting for years and years in electric railway service with astonishingly few replacements. They have paid for themselves many times by economy in maintenance.

THE HESS-BRIGHT MANUFACTURING CO.
Front St. & Erie Ave., Philadelphia, Pa.

Hess-Bright's Conrad Patents Are Thoroughly Adjudicated

THE LATEST DEVELOPMENT IN RADIAL M.C.B. EQUIPMENT



For Electric Traction Cars

The Van Dorn Vertical Pivoting M.C.B. Coupler Head with Double Spring Radial Draft Gear is shown above

The Vertical Pivoting of the Coupler Head

Prevents binding of the knuckles and relieves all strains from the car platforms when train of cars are operated over abrupt changes in grade.

COUPLER HEAD is held in normal coupling position by TRIPLE SPRING SUPPORT located in casing directly under coupler head.

The Coupler

has a positive lock, lockset and knuckle throw.

Couples by impact and uncouples from side of car.

Has extended guard arm and butting wall which greatly facilitate coupling and prevent buckling.

Has deep knuckles which permit wide vertical movement.

Radial Carrier eliminates binding even on 30-ft. radius curve. Double Hercules spring draft gear is very effective in absorbing shocks and makes a train move as one car.

The Above Equipment will Interchange with all Standard M.C.B. Couplers

WRITE For Blueprints and Prices

Van Dorn Coupler Co.

2325 So. Paulina St. Chicago, Ill.

The Safety of the Service
Rests on the Reliability of the Wheels

Your patrons must trust you to maintain safe equipment. They cannot judge the safety of a car by looking at it. They expect you to *know*.

A broken wheel means instant disaster. It cannot be "good enough"—it must be absolutely reliable.

Therefore, the *best* only should be considered. For passenger service, especially high speed electric cars, there is only one best. That is a *steel* wheel—with a one-wear ferro-manganese tread—namely, the Davis Steel Wheel.

AMERICAN STEEL FOUNDRIES
1100 McCormick Building CHICAGO

Collier Service

puts value
into Car Advertising
Space

ANY amateur can place cards in your cars; but these cards will have little or no value to the advertiser.

Collier Service develops the maximum advertising value of your card space, and maintains that maximum.

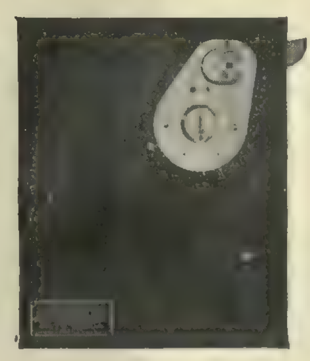
Just to fill the space with "any old kind" of cards is like having a store with practically nothing in the show window to attract customers and to make them enter the store and buy.

Collier Service makes the show spaces in your cars so attractive that the passengers are induced to become purchasers of the products advertised. This makes possible an assured income to the Electric Railway from the advertising space in its cars.

Barron G. Collier
INCORPORATED

Candler Building
220 West 42nd Street, New York City

Havana's Fastest Cars Carry Rico Coasting Recorders



The Havana Central Railroad recently purchased 21 Rico Coasting Recorders for the Marianao train and single car service of the United Railways of Havana.

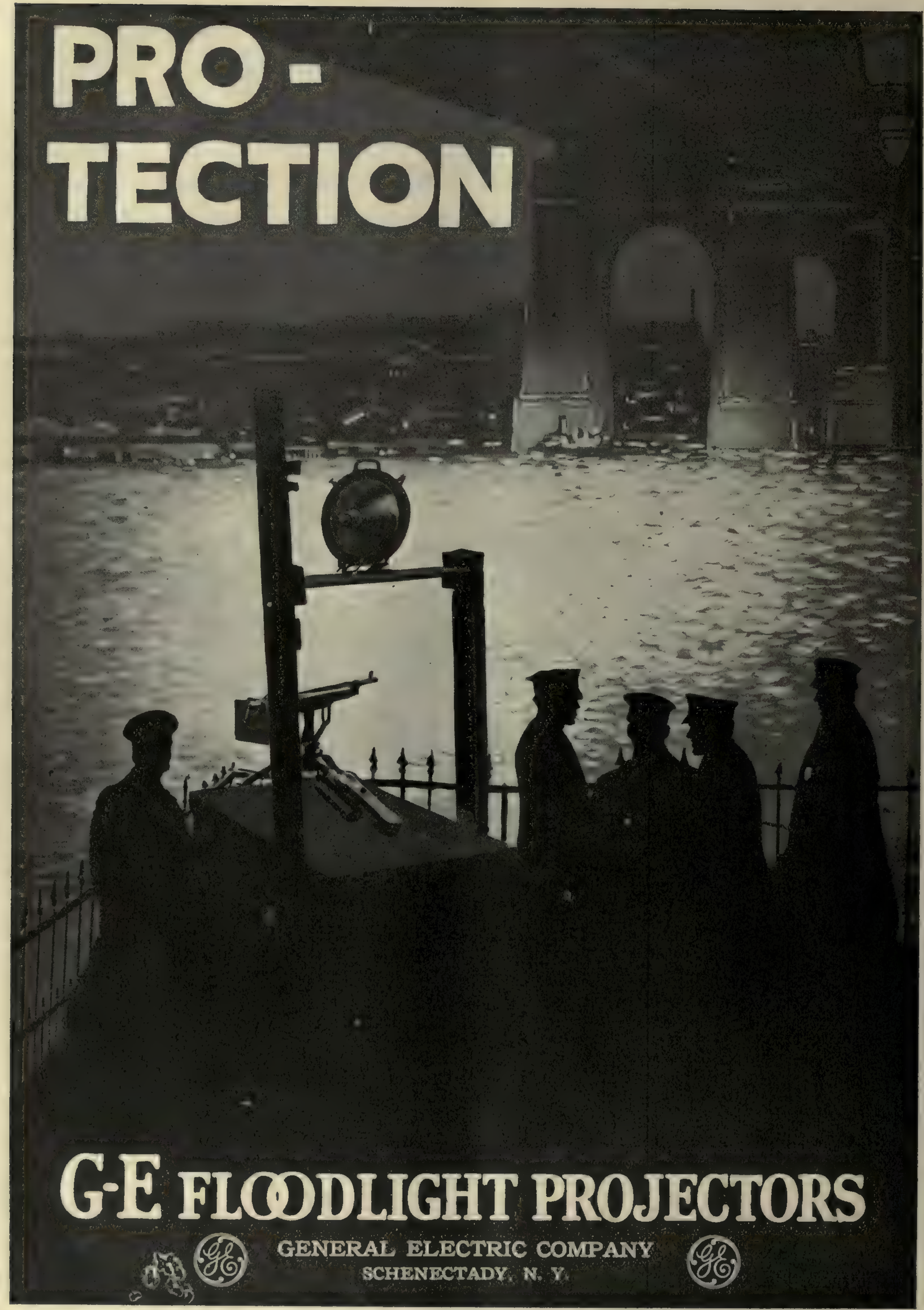
This purchase was made after convincing evidence of what Rico Coasting Recorders had accomplished on thousands of cars in every class of service.

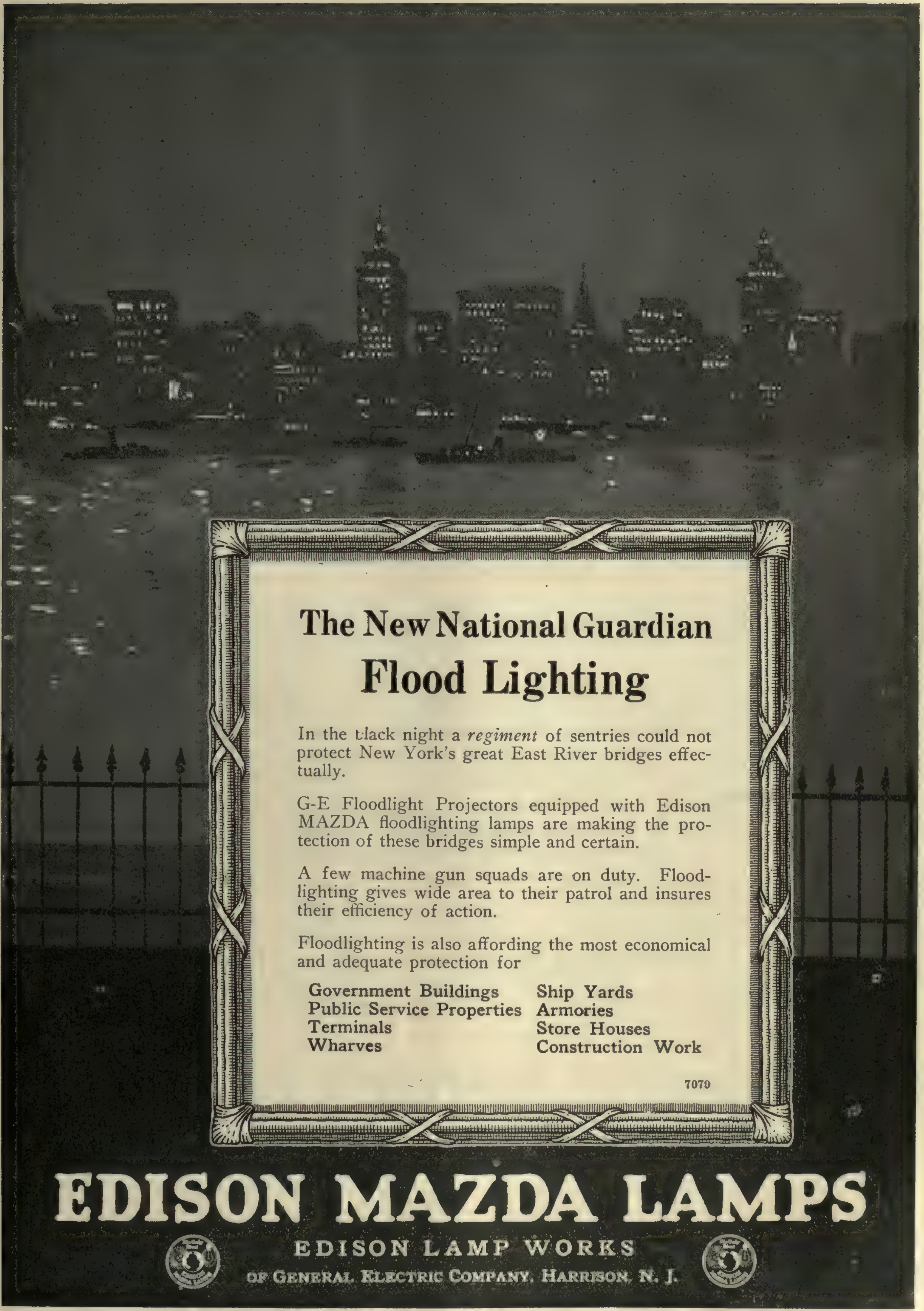
No elaborate tests were found necessary to prove that the Rico Coasting Recorder embodies

The True Principle for Measuring Operating Efficiency

Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK


PRO-
TECTION
G-E FLOODLIGHT PROJECTORS
GENERAL ELECTRIC COMPANY
SCHENECTADY, N. Y.



The New National Guardian
Flood Lighting

In the black night a *regiment* of sentries could not protect New York's great East River bridges effectually.

G-E Floodlight Projectors equipped with Edison MAZDA floodlighting lamps are making the protection of these bridges simple and certain.

A few machine gun squads are on duty. Floodlighting gives wide area to their patrol and insures their efficiency of action.

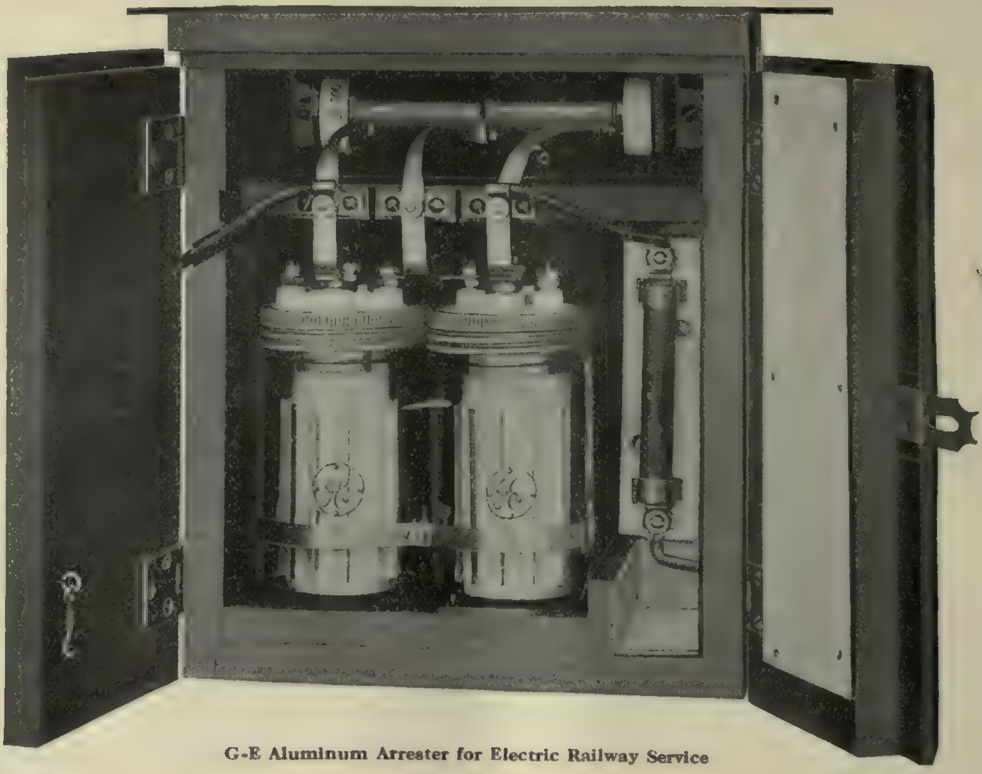
Floodlighting is also affording the most economical and adequate protection for

Government Buildings	Ship Yards
Public Service Properties	Armories
Terminals	Store Houses
Wharves	Construction Work

7079

EDISON MAZDA LAMPS

EDISON LAMP WORKS
OF GENERAL ELECTRIC COMPANY, HARRISON, N. J.



G-E Aluminum Arrester for Electric Railway Service

The Master Mechanic Said–

when he was asked about his experience with G-E Aluminum Arresters for the protection of street car equipments against lightning:

> ***"We hope that other people in our end of the game experience the same pleasure we do at the end of electrical storms with the performance of these arresters."***

Service interruptions and large repair bills on account of lightning can be rendered insignificant by the use of G-E Aluminum Arresters.

General Electric Company

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
*Dallas, Tex.
Dayton, Ohio
Denver, Colo.
†Detroit, Mich.
Des Moines, Iowa
Duluth, Minn.
Elmira, N. Y.
Erie, Pa.
*El Paso, Tex.
Fort Wayne, Ind.
Hartford, Conn.

General Office: Schenectady, N.Y.

ADDRESS NEAREST OFFICE

*Houston, Tex.
Indianapolis, Ind.
Jacksonville, Fla.
Joplin, Mo.
Kansas City, Mo.
Knoxville, Tenn.
Los Angeles, Cal.
Louisville, Ky.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.
New Haven, Conn.
New Orleans, La.
New York, N. Y.
Niagara Falls, N. Y.
*Oklahoma City, Okla.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Providence, R. I.
Richmond, Va.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal.
Schenectady, N. Y.
Seattle, Wash.
Spokane, Wash.
Springfield, Mass.
Syracuse, N. Y.
Toledo, Ohio
Washington, D. C.
Youngstown, Ohio

*Southwest General Electric Company. †General Electric Company of Michigan
For Canadian Business refer to Canadian General Electric Company, Ltd., Toronto, Ont.
General Foreign Sales Offices, Schenectady, N. Y.; 30 Church St., New York City; 83 Cannon St., London, E. C., England 6886

Electric Railway Journal

Published by the McGraw-Hill Publishing Company, Inc.
Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIX NEW YORK, SATURDAY, MAY 12, 1917 Number 19

HIGHER FARES ARE NOW NECESSARY

"How do the public service corporations manage to maintain the old prices when the ice man, the coal dealer, the dairy man, the doctor, lawyer, merchant and chief all are boosting the prices of their own wares?" In the face of the admitted increase in public utility expenses, it is no wonder that the St. Joseph (Mo.) *Gazette* recently asked editorially the foregoing question. The paper did not present any answer, but only one would have been possible. Continuously rising costs, with prices rigidly fixed, can be met only by forcing economies beyond the demands of efficiency and suppressing development below the demands of the public. That is how the electric railway industry has been able up to this time to continue operation under the old price of a nickel. But with all costs still on the upward march, a limit has been reached, and the present seems logically the time to increase fares. The issue came to the front in New York this week through publication that at least one electric railway company in New York City had held informal discussions with the Public Service Commission, First District, in regard to higher fares and also through an address on the subject by President Loree to the stockholders of the Delaware & Hudson Company at the annual meeting of that corporation. In this address Mr. Loree, in referring to the situation on the trolley roads owned by that company, said that an abolition of the pavement charges would help greatly, but he also suggested as the two main methods of increasing revenue, a charge for transfers, and a 6-cent fare. We are inclined to favor the last-named method as a general solution, for we feel that the popular idea of having the nickel as a fare limit should be thoroughly killed. The problem is big, and it demands a big solution.

WOMEN CONDUCTORS A POSSIBILITY?

Even if we had not the experience of Canada as well as of the European countries to guide us, it would be possible to say with certainty that, if the United States Government is ever able to stop talking and get the country on a war footing, a distinct shortage of labor will confront the electric railway industry. To meet this the most obvious possibility in the train service seems now to be the employment of women conductors. Clearly enough, the plan, according to experience in Great Britain, is practical and, as a means for releasing men for other services in case that necessity arises, is unquestionably effective. Of course there are difficulties in the way, such as the conservatism of the public and the necessary reorganization of the service and operating practice to make provision for woman's inferior strength and endurance. Nevertheless, this latter feature is not of great import where modern prepayment features and fully-inclosed vestibules are installed on the cars, and since opposition to such a change cannot be insurmountable where a real need for it exists, we feel that the experiment might well be tried out where existing circumstances permit a reasonable chance for its success. Certainly the conductor on a modern car is little more than a change clerk, and it seems only logical that women, whose adaptability for this kind of work has been amply demonstrated in other businesses, should be employed for the purpose by electric railways.

TRUCK GARDENS ON RIGHT-OF-WAY INVOLVE RISK

In the present general movement to lease out railway right-of-way for truck gardening purposes, certain risks are involved which should be guarded against by the companies granting the lease right. Basically, the movement is a most commendable one and in harmony with the war-made necessity for increasing our production of foodstuffs. The railways are doing well to grant this privilege with as few restrictions as practicable. However, the practice does tend to reduce the railway's control of its right-of-way, since it encourages trespassing—an always dangerous and wisely-prohibited act. Hence, while we believe in railways acting in accord with patriotic incentive, they should also protect themselves against the possibility of any resulting serious accidents which would incur a liability to the company and a loss to the community entirely incommensurate with the good to be gained. Precaution should be made against this danger by a clause, prominently inserted in the lease, calling attention to the risks involved by proximity to railway track and absolving the company from responsibility should the lessee meet with personal injury or property damage in the course of his agricultural pursuits. In addition it would be well to follow the example of those railways which have required that no corn or high-growing plants shall be permitted at any point where the view of motormen might be obscured and that no children be permitted to attend gardens located along the right-of-way. With these precautions there is nothing particularly radical about the procedure. It has been in use for a number of years by electric railways on the Pacific Coast, notably in the fertile Sacramento Valley, where the plan of leasing sections of the right-of-way at a nominal rental to farmers along the line was adopted as a substitute for planting grass to keep down dust or unsightly growths of weeds, and here it seems to have worked out satisfactorily to all concerned.

THE REAL AMERICAN AUTOCRACY

We had to smile at the ridiculous analogy which the *New Republic*, in its issue of April 28, drew between the European War and the recent street railway strike in Washington, D. C. In its opinion, the supremacy of autocracy or democracy was the issue in the capital city, as it is in the present world conflict. You wonder how! Listen. The Washington Railway & Electric Company, confronted with a demand from its Amalgamated Association employees for a "closed shop," dared so far forget American democratic principles as to offer attractive individual contracts to its loyal employees. This awful display of autocratic power, which has resulted in normal operation under a partly new but wholly satisfied organization, is "an outrage," it is said, "a vital blow to the future of industrial democracy."

Now, liberty and democracy are glorious words, but we insist that they ought not to be used to justify the unbridled license which destroys freedom—in other words, that license which robs some of their freedom to use their capital in a legitimate business enterprise; others of their freedom to ride at their convenience on a public carrier, and still others of their freedom to work and make individual contracts. There are many people in this country who do not yet fully realize that individual liberty does not mean liberty to tyrannize over others. Labor leaders especially are blind to the fact that others have rights as well as themselves, and some of them, with the arrogance that betrays the real autocratic leader, have loudly insisted that they belong to a privileged class. Yet all such penny imitators of the Kaiser may well pause and ponder, for world events now show, as never before, that privileged classes must go.

The *New Republic* alleges that the power of the Washington company to enforce its autocratic will against its disorganized employees is absolute, "for any attempt at collective action on the part of the men, for the redress of any grievance whatsoever, would not only make them liable to immediate discharge for insubordination, but would also expose them to legal prosecution." The fact is, however, that the individual agreement signed by the Washington employees provides for an "open-shop" and for the presentation of grievances on stated days to the superintendent, with an appeal to the president and finally to the Public Service Commission. The matter of discharges can also be carried up similarly to the commission for final determination. The only restrictions are that the men shall present complaints in person or through a committee of employees, and that there shall be no strike action, although single employees may leave the service peaceably.

These provisions constitute no attack upon personal freedom in so far as it is compatible with public welfare. The company retains the right of discipline, which is necessary for efficient operation. On the other hand, the employees are protected from discharge without cause; they can approach the company collectively, through their own committees, and they can seek other employment, if they as individuals so desire. But, and to the *New Republic* this seems the unpardonable sin—they agree not to suspend service collectively in disregard of the paramount public interest.

"For the sake of decent and harmonious industrial relationships, which have such critical importance to the nation at this time," to use the magazine's own words, we hope that our contemporary will read the Adamson decision and then devote a little energy toward helping labor to see that it is part of the public, and not *vice versa*. We do not look upon the individual working agreement as a perfect instrument for bringing industrial peace, but it is useful means to a worthy end. For it is quite possible that its wider use may put labor in a more receptive mood for wage fixing by scientific methods rather than by brute force.

SELECTING LINE INSULATORS

As line voltages have increased with the development of electrical transmission the insulator has been the element of greatest weakness and has, therefore, been the cause of greatest anxiety on the part of manufacturers and operators. The end is not yet in sight, either, but progress is being made. The "liveness" of the subject is indicated by the attention being given to it by the electrical engineers. A whole session of the coming convention of the A. I. E. E., to be held at Hot Springs, Ark., will be devoted to four papers on high-tension insulators and the accompanying discussion. Two of these appear in the May issue of the *Proceedings*, and show clearly what the present problems are in general and in detail. An important paper on insulator testing was read at the December meeting of the same association.

In the pioneer days of power transmission development selecting line insulators was very much like buying hats at a cross-roads general store. If the desired style and size were available everyone was happy. If not, the purchaser did the next best thing and took what he could get. The selection was perforce easy. Since that time, however, the duty of the insulator has been made the subject of scientific investigation, and equally careful studies have been made as to the methods of selecting the proper type of insulator for a given duty. Tests have been devised for the purpose of detecting faulty parts while the insulator is in process of manufacture and also for the purpose of determining the relative efficiency of different types or designs. Various technical societies have done notable work both in carrying on active investigations and in securing the co-operation of experts in the insulator field. They have proposed standard specifications which are valuable as a guide in the selection of new insulators for a given service.

The selection problem, as it interests the electric railways, is to a great extent that of selecting new insulators for replacing broken down or otherwise defective ones. While not as simple as it once was, the whole process has been placed upon a more scientific basis, and properly selected new insulators should give much better service than did the old ones which they replace. The selection process itself, in most cases, is somewhat simplified by the fact that the line supports admit of the use only of the pin-type insulator. With the physical and electrical characteristics of the line known the mechanical and electrical stresses which the insulators must withstand can be pretty definitely predetermined. Climatic conditions usually have much to do with the choice of petticoat shapes. With these conditions known, and the desired electrical and mechanical characteristics either calculated or determined by actual test, the final process in the problem is the mating of these requirements with a commercial type of insulator. The very complete data furnished nowadays by reputable insulator manufacturers relative to their various types of insulators greatly facilitate the mating process.

In making replacements there seems to be considerable tendency to use better insulators than were those being replaced. It is quite true that the promiscuous mixing of the newer and stronger insulators with the older ones may hasten the retirement of the latter. Despite this fact, however, we believe that the policy of using a higher grade of insulators for replacement work is, at least as far as the older types are concerned, a good one, for on a live railway both the duty imposed on insulators and the demands as regards standards of service are increasing.

RETIRING THE VETERAN POWER PLANTS

We are giving a prominent position and much space in this issue to a new power plant of small immediate size because it is typical of the metamorphosis through which the power plant, considered as a species, is going at the present time. The old-time, slow-going but sturdy engine is giving place to the humming turbine, much to the benefit of the coal pile. At the same time improved condensers, boilers, furnaces and auxiliaries are being substituted for less efficient types, while labor-eliminating devices are producing savings commensurate with those accomplished along the lines of fuel and water saving. All of these things are illustrated in the New Haven plant under discussion this week.

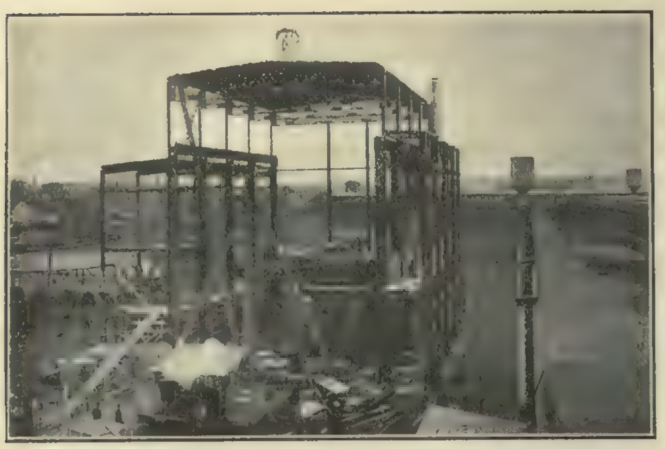
This station is also of unusual interest as an example of what can be done in the way of rapid construction, even in times of slow delivery, when the utmost is made of available resources. So rapid has been the progress in turbine and auxiliary design that the installation of second-hand equipment is economical only under unusual conditions. In this the minimum steam consumption is about 16 lb. per kilowatt-hour whereas a modern turbine would use, say, 20 per cent less steam. To offset this difference, however, there is the lower cost of the unit and the promptness with which it could be obtained. Tests already made in the new plant indicate a unit coal consumption of about 2.5 lb. per kilowatt-hour, the coal running from 14,000 to 14,200 B.t.u. per pound. As 1 B.t.u. is the equivalent of 0.293 watt-hour this 2.5 lb. would produce from 10.2 to 10.4 kw.-hr. if there were no loss in transformation. The efficiency of the plant from coal pile to switchboard is, then, about 9¾ per cent, or in round numbers 10 per cent. This will be recognized as a creditable showing when one considers that the turbines and condensers are far from modern, that the generating unit is not yet economically loaded, and that the plant as a whole is new.

TACT NEEDED IN INTRODUCING ONE-MAN CARS

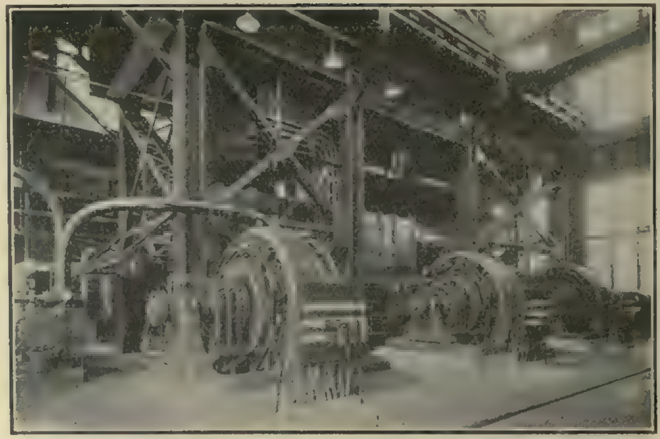
The experience of some operating companies in the introduction of one-man cars emphasizes the importance of bringing forward such equipment in a tactful way with respect to all interested parties. The design of the one-man or "safety" car, as it has well been called, appears radical to some municipal authorities and has been known to arouse an entirely unjustified opposition on the part of the public when reports have been spread abroad in the daily press that a revolution in rolling stock is under contemplation. Labor interests, too, have come forward in some cases to oppose the introduction of one-man cars on the ground that their use threatens the permanency of employment of the men on the existing transportation payroll.

Within certain fields, which are well understood by many operating men, this type of car is definitely proving its usefulness. But in such places it has been more successful when used primarily to increase the gross receipts by giving a more frequent service rather than to decrease the operating expenses through a reduction of the transportation force. For war conditions, it is true, when additional labor is difficult to obtain, the one-man car would appear to be exceptionally well adapted for moderate or light traffic routes, but in most cases the natural growth of traffic should banish fear on the part of the trainmen that their tenure of employment will be jeopardized. The situation is not unlike that in the central station field when the tungsten lamp first made its appearance in that the new product greatly increased the popularity of electric service in competition with older forms of illumination and resulted in a largely increased use, despite the early and ungrounded fears of some central station managers that only the same amount of light would be used.

Since the exact field of usefulness of the one-man car on many properties must be demonstrated by experience, the installation of such units in small groups without elaborate advance publicity appears a wise policy. Many critics of the one-man car have never seen it in service, much less ridden in one. To acquaint the public officials with actual service performance in neighboring cities or towns will prove helpful through personal demonstration when such a course is feasible, as thereby opposition will be disarmed well in advance of the appearance of a few trial units on the streets. Such opposition may be aroused by present hostility based upon entirely mistaken notions that the introduction of the new service means less service for the public. Let the one-man car tactfully feel its way, and we are convinced that it will become increasingly popular in the field of its economic usefulness.



CONNECTICUT COMPANY POWER PLANT—CONSTRUCTION VIEW SHOWING FRAMING OF BUILDING AND TURBINE FOUNDATION



CONNECTICUT COMPANY POWER PLANT—VIEW IN TURBINE ROOM SHOWING TURBINE SUPPORT, CONDENSERS AND ROTARY CONVERTERS

Connecticut Company's Power Plant

The New Grand Avenue Plant Is Being Superimposed on the Old One Without Interruption to Service—The Design Has Been Complicated by Market Conditions Which Have Made Necessary the Adaptation of Some Second-Hand Equipment

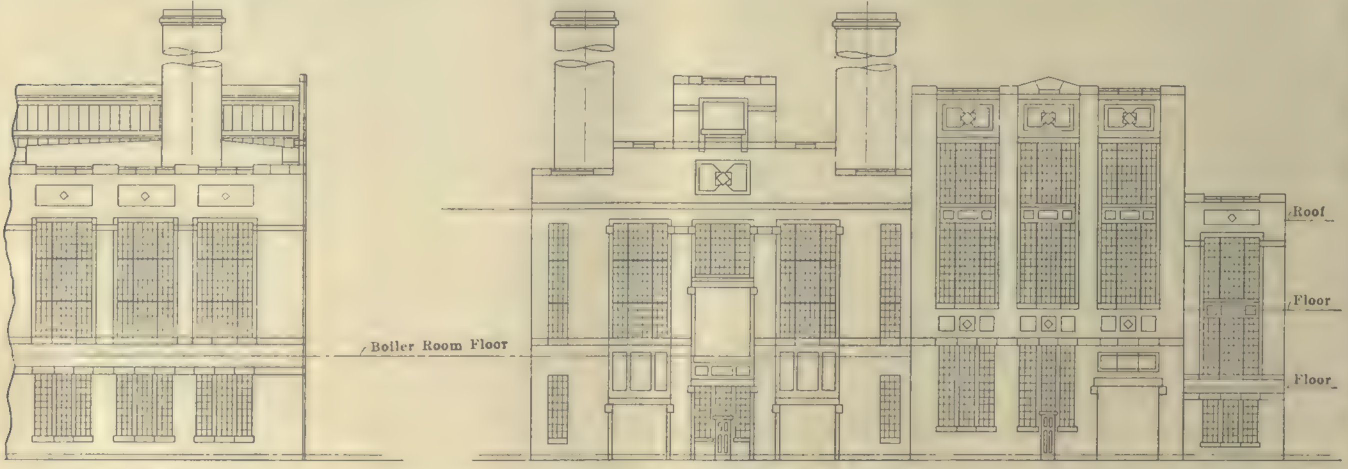
FINDING itself short of power, particularly for the needs of the New Haven division at the moment, the Connecticut Company decided a year or more ago to remodel its Grand Avenue steam plant in New Haven. It would be more accurate to say that it was decided to retire the old plant as rapidly as possible, substituting for it one of modern design and using only such of the existing equipment as was strictly modern. As the engineering staff of the company was fully occupied with its operating problems, unduly heavy on account of the extra traffic due to the munitions business in its territory, the J. G. White Engineering Corporation was called in to design and supervise the construction of the first unit of the new plant. The design and construction were pushed rapidly during the summer, fall and winter, and the work is now practically completed.

SOME SECOND-HAND EQUIPMENT HAD TO BE USED

On account of market conditions it was necessary to purchase some second-hand equipment and to work this into the scheme so that eventually it could be replaced with larger and more modern apparatus without interfering with the logical development of the plant. While providing for immediate power requirements, the new plant was designed as one section of a power station of 100,000-kw. capacity or more, laid out economically to use the entire available site. The layout of the complete plant as tentatively outlined is shown in an accompanying simplified drawing, on which the first unit is indicated by solid lines. To avoid confusion the parts of the original plant which will be retained for the present are omitted. The earlier plant formed the basis of an illustrated article in the issue of the ELECTRIC RAILWAY JOURNAL for March 3, 1906, page 338. At that time it had been in operation for about twelve years, but since the article was published there have been some additions to the equipment, particularly in the boiler room. In the present article, however, attention will be focussed on the new part of the plant.

THE COMPANY IS LOOKING TO THE FUTURE

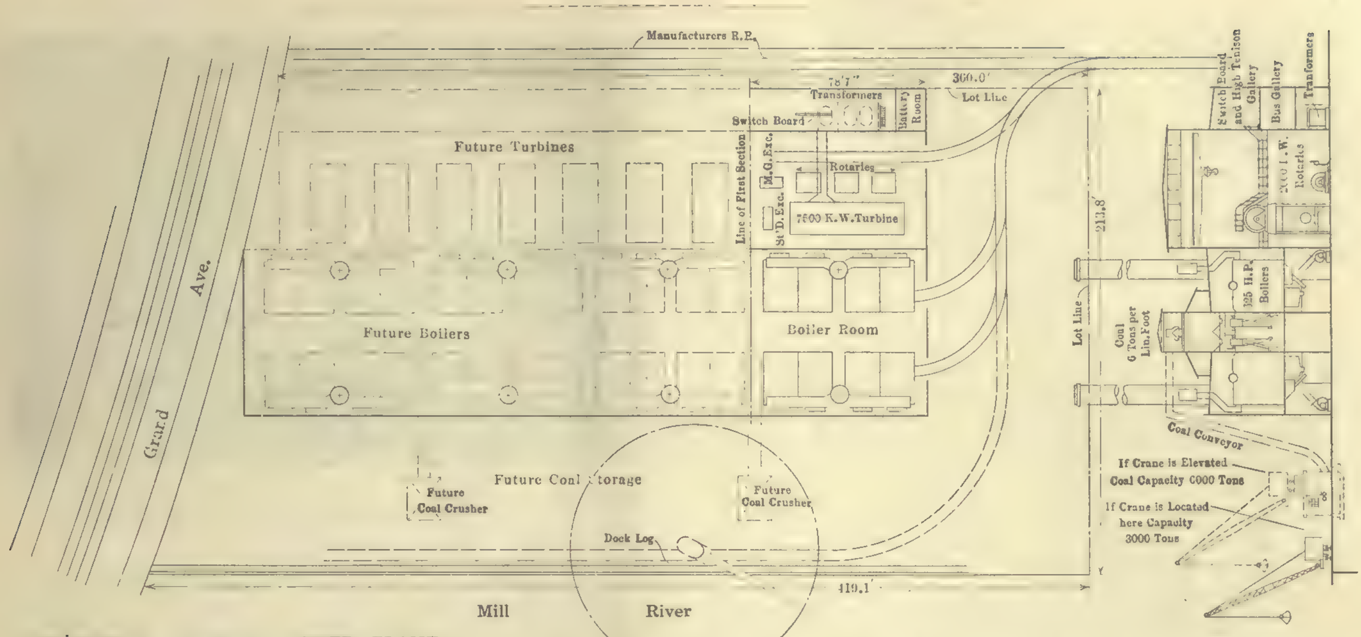
In a study of this plant, as projected and as already completed, it must be borne in mind that the problem



West Elevation

South Elevation

CONNECTICUT COMPANY POWER PLANT—ELEVATIONS OF BUILDING, SHOWING GENERAL ARCHITECTURAL TREATMENT OF DETAILS



CONNECTICUT COMPANY POWER PLANT—PLAN AND VERTICAL SECTION OF PRESENT AND PROPOSED POWER PLANTS

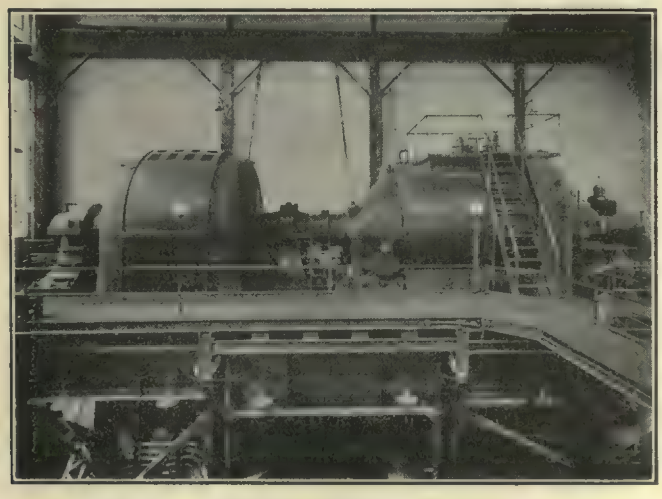
was to provide an immediate power supply, and at the same time to allow for future expansion at minimum expense. The first unit was also to contain a substation for local demands for direct current. The ultimate plant, of course, will furnish power over a large territory, so that the first unit was designed to tie in with a general distribution and generating system.

The proposed complete plant layout shows the first unit to differ considerably in plan from those which are to follow. The reasons for this are as follows: The second-hand 7500-kw. Westinghouse turbine purchased for this unit is longer than more modern turbines even of much greater capacity; hence it was placed lengthwise with the building. It was considered probable, also, that it would be desirable to replace this machine with a 30,000-kw. unit as local demands for power increased, and the supporting structure was designed to this end. Further, the longitudinal arrangement of the turbine provided a convenient spacing of the rotary converters, which will not be required in the later units. This arrangement of turbine and rotaries permitted the laying of a railroad track into and through the turbine room, greatly facilitating construction and repair. The switchboard bay containing three galleries is a feature of the first unit, and, while the plan shows it extended out to Grand Avenue, this extension will not be necessary for switching purposes. It, however, provides space for larger turbines than those shown in case changes in plan make the use of such turbines desirable, and for transformers which may be required for stepping up the voltage for power transmission to distant points.

ACCESSIBILITY IS CONSPICUOUS IN THE TURBINE ROOM

On entering the turbine room one is struck by the location of the turbine high in the air, its base being 27 ft. above the floor. It was so located to permit all accessories to be practically above floor level, and to provide space for a much larger future condenser. The steel turbine foundation consists of an eight-column, diagonally braced frame carrying deep plate girders at the top. It is strong enough for a modern 30,000-kw. unit. This, of course, would not be proportionately heavier than the present 7500-kw., 25-cycle, 750-r.p.m. machine, which weighs about 715,000 lb., as it would be of higher speed and modern design. The turbine is now running on its elevated support with very little vibration, which is least at heaviest load.

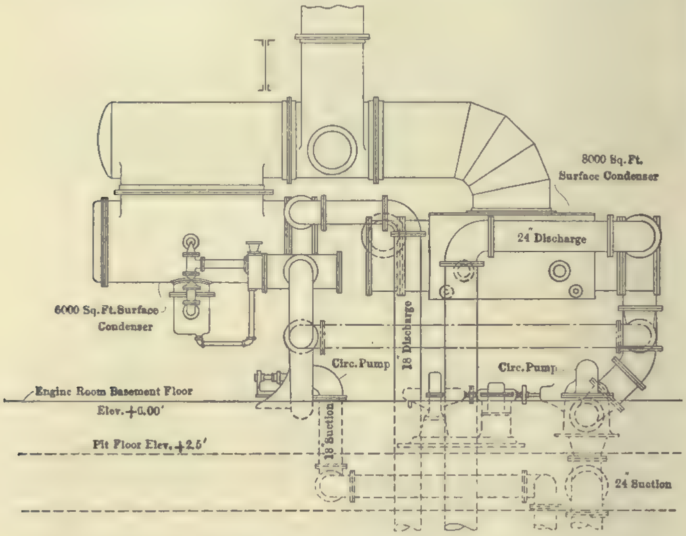
A walkway around the base of the machine is bracket supported and floored with checkered steel plate. It connects by a bridge with the switchboard gallery and will ultimately join on the same level the walkway around


CONNECTICUT COMPANY POWER PLANT—7500-KW. TURBINE AND GENERATOR

CONNECTICUT COMPANY POWER PLANT—BOILER FRONTS WITH STOKERS AND SPOUT LEADING FROM WEIGHING LARRY

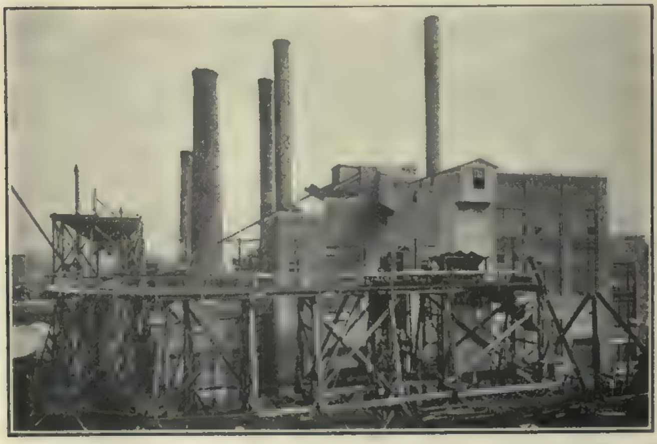
the contiguous turbine unit. The bridge was made removable to provide clearance in moving heavy pieces. In the turbine room is a 50-ton, motor operated Shaw crane, powerful enough to handle any part of the present or prospective equipment safely and expeditiously.

At present two condensers are used for the one turbine, a temporary expedient due to the impossibility of obtaining a single condenser in reasonable time. Both condensers are of the surface type, Worthington make, one having 8000 sq. ft. and the other 6000 sq. ft. of condensing surface. A drawing is reproduced to show how the piping arrangements were worked out for this unusual case. Like the turbine, the condensers were purchased second hand. The larger one was originally a four-pass base condenser and it was changed to two-pass; the other was of the side-bottom inlet type, but in adapting it to the present location the shell was turned, making a side-top arrangement. The exhaust connections were made of steel plate because cast iron could not be procured in reasonable time.



CONNECTICUT COMPANY POWER PLANT—ELEVATION OF CONDENSERS AND PIPING

The turbine foundation rests upon the 2-ft. wall of the intake-discharge tunnel structure, which is 16 ft. wide outside. This structure provides a 6-ft. x 12-ft. discharge tunnel above and an intake tunnel of the same size below. It in turn rests on a pile-supported, heavy concrete cap. The soil is light in texture and is saturated with water below tide level, necessitating unusually substantial footings. In this case wood is used for the piles, as they are continuously below tide water. In other parts of the building Raymond concrete piles are used wherever the piles project above low-water level.



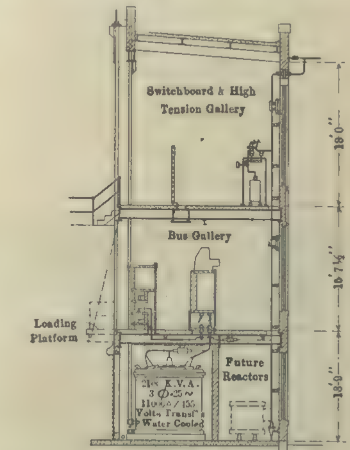
CONNECTICUT COMPANY POWER PLANT—SOUTH AND WEST SIDES OF BUILDING, SHOWING TEMPORARY COAL-HANDLING EQUIPMENT

CONNECTICUT COMPANY POWER PLANT—CONSTRUCTION VIEW IN BOILER ROOM

BOILER ACCESSORIES ARE LARGELY IN THE TURBINE ROOM

In space projecting under the boiler room and opening into the turbine room are located most of the turbine and boiler auxiliaries, including the two steam-driven stoker fans, the feed-water heaters, the dry vacuum pump and the boiler feed pumps. This arrangement places all of the steam machinery of the plant together and within easy reach of the turbine-room attendants. The boiler-room auxiliaries are thus away from the dust of the boiler room, and can have better attention than would be possible otherwise. At the same time these auxiliaries are as close to the boilers as they could well be placed. The feed-water heaters mentioned above are of National make, two in number, each large enough for the present plant capacity. They are equipped with Bailey V-notch meters, which with the coal-weighing larry, referred to later, permit the keeping of accurate boiler-room records.

The boiler section of the new plant contains eight Hornsby-Biglow boilers, set high enough above ground level to permit railroad cars to be pushed directly under the ash hoppers. The boilers are rated at 625 hp. and they are furnished with Taylor stokers to permit forcing to 250 per cent of rating. In each is a superheater of a size to produce 100 deg. Fahr. superheat at maximum load. Air is furnished by the two steam-driven blowers already mentioned and a motor-driven



CONNECTICUT COMPANY POWER PLANT—CROSS-SECTION OF TRANSFORMER AND CONTROL GALLERIES IN TURBINE ROOM one on the side of the boiler house away from the turbine room. A cross-section of the boiler room is reproduced, which, with the accompanying halftones, will serve to show its salient features.

The stokers have the new steam-operated dumping plates by means of which the ashes can be dumped in a half minute or less, without affecting the boiler pressure. The plates are controlled by levers at the side of the boiler, so placed that a full view of the dump plates can be had during the dumping operation if this is desired.

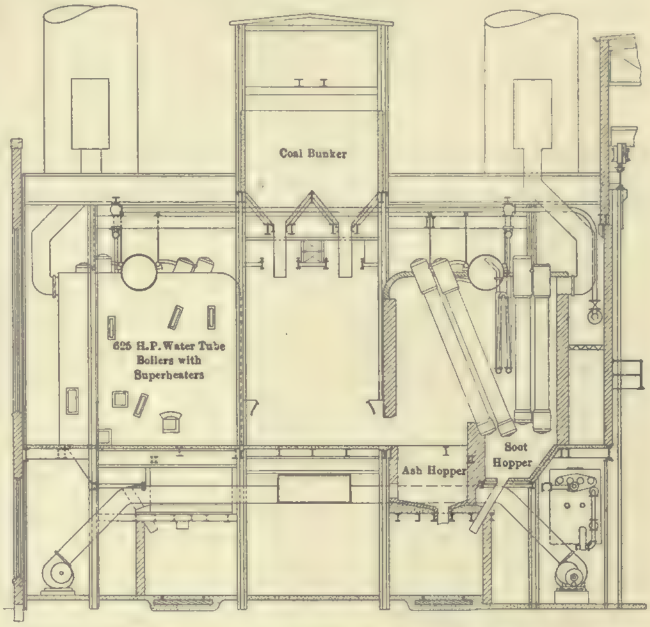
For the present the steel stacks of the old plant are being used, but each battery of four boilers will eventually have its own steel stack, of 13 ft. 8 in. internal diameter, the flue diameter inside the brick lining being 9 ft. 10 in. These with the flue breechings will rest on the roof, with risers from each boiler passing upward through the roof.

PRESENT AND FUTURE PROVISIONS FOR COAL HANDLING

The coal and ashes handling problem in this plant is a comparatively simple one, owing to the ideal location of the site with respect to steam railroad and water connections. The details of this matter for the complete plant have not yet been worked out, but suggested plans are shown in the drawing first referred to. That shows a locomotive crane traveling on a track along the Mill River dock, either skirting the edge of a storage pile to occupy the space between the power house and the dock, or on an elevated structure above the storage space. The track will connect with the Manufacturers' Railroad, which in turn furnishes connection with the New Haven Railroad. Eventually there will probably be two elevator conveyors which will take the coal from storage to the overhead bunkers.

For some time, however, the very satisfactory, although temporary, coal-handling equipment which appears in one of the accompanying halftones will continue to be used. It consists of a short and considerably elevated track on a light timber trestle connecting a point on the dock with one opposite the end of the boiler room. At the dock end is an elevated hopper served with a derrick by means of which coal is transferred to it from the barges. A coal car of design special for this work has been built, as has also a simple electric locomotive for use in carrying the coal from the overhead hopper to a conveyor, which distributes it to the boiler room bunkers.

These bunkers are designed for 6 tons of coal per foot of length, the total capacity being 450 tons for the original eight boilers. Below them is a traveling weighing larry from which the coal is spouted to the stoker hoppers.



CONNECTICUT COMPANY POWER PLANT—CROSS-SECTION OF BOILER HOUSE

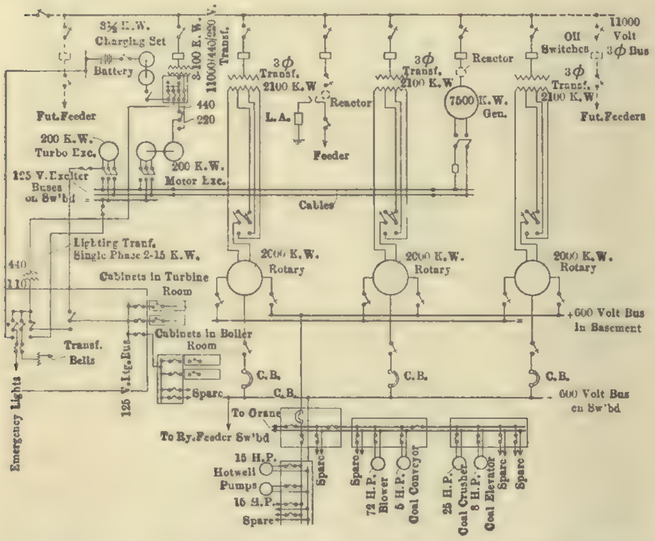
ELECTRICAL EQUIPMENT IS PRACTICALLY STANDARD

The interesting features of the electrical end of the new plant are shown in a cross-section of the gallery side of the turbine room. On the ground floor is a row of three three-phase, 11,000:445-volt, water-cooled transformers, behind which will later be placed a set of reactance coils (one of which is shown in dash lines in the drawing). Immediately over the transformers at the front are the compartments containing the flat busbars, and at the rear the motor-operated oil switches. These

CONNECTICUT COMPANY POWER PLANT—OIL SWITCH AND BUSBAR COMPARTMENTS ON MIDDLE GALLERY—ALTERNATING-CURRENT AND DIRECT-CURRENT OPERATING PANELS ON TOP GALLERY IN TURBINE ROOM are of the GE-H3 type. This arrangement provides very simple high-tension wiring on these two galleries.

The uppermost gallery contains the switchboard and horn gaps and electrolytic lightning arresters for an 11,000-volt alternating current circuit, and from it also the direct current feeders pass through bushed holes in the wall to the overhead line. The switchboard is so placed as to command a view of the entire turbine room and it is conveniently reached by the bridge from the turbine walkway.

The electrical features of the plant are summarized in the accompanying circuit diagram. On this it will be noted that, in addition to the items already mentioned, there is double provision for excitation from a 200-kw. turbine set and a 200-kw. motor set. A storage battery supplies current for oil-switch operation and emergency lighting, charged from a 3½-kw. motor-generator set. The whole plant is brilliantly lighted by tungsten lamps, and partly for decorative purposes the turbine is surrounded by lamps mounted on simple pipe standards.



CONNECTICUT COMPANY POWER PLANT—DIAGRAM OF ELECTRIC CIRCUITS IN POWER HOUSE

As is customary in modern plants this one is supplied with many of the minor conveniences and safeguards which increase the safety and comfort of the employees or warn of abnormal operating conditions. A well-equipped wash-room with shower bath, railings at all dangerous places, stairways with wide treads, etc., are examples of this feature. An eight-station Western Electric interphone system connects all important points, a Klaxon horn being used to attract attention to a call. A soundproof booth with Klaxon signal is used in connection with outside calls. Bell signals are also provided to indicate opening of a.c. and d.c. circuit breakers, excess temperature or defective water circulation in transformers, and high and low level in the sump well.

The operation of the Rouen (France) Tramways during 1916 was characterized by two important facts—the large increase in traffic, due essentially to the economic and industrial development around Rouen, and the still greater increase in operating expenses. The increase in the price of coal alone caused an additional expense of $50,000. The operating receipts in 1916 were $877,715, as compared to $720,817 in 1915, and the total receipts in the two years were $890,348 and $740,399 respectively. The operating expenses increased from $410,078 in 1915 to $584,024 in 1916. The gross profit for 1916 was $306.324.

Committees of the Southwestern Association

In the report of the meeting of the Southwestern Electrical and Gas Association published last week the names were given of the officers elected at the meeting at Dallas. In addition, the following committees were also elected:

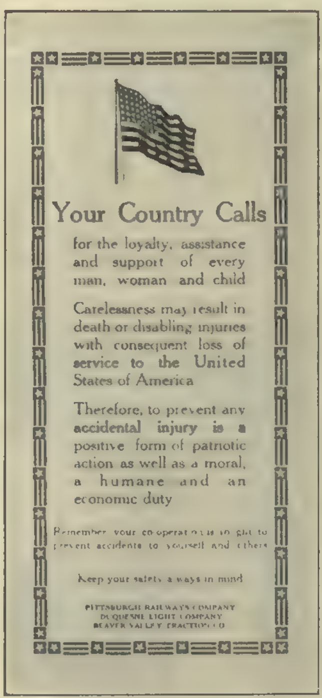
Executive committee: F. R. Slater, H. C. Morris, Burr Martin and H. S. Cooper, Dallas; D. A. Hegarty, Houston, and W. A. Sullivan, Shreveport, La. These will compose the committee with the following hold-over members; G. H. Clifford, Fort Worth; W. B. Tuttle, San Antonio; F. J. Storm, Amarillo; W. B. Head, E. S. Fletcher and R. Meriwether, Dallas; J. C. Kennedy, Brenham, and S. R. Bertron, Houston.

Advisory committee: B. F. Cherry, Weatherford; A. Patterson, Texarkana; W. W. Holden and R. C. Jones, San Antonio; F. D. Murphy and C. A. Newning, Houston; Alba H. Warren and F. M. Lege, Jr., Galveston; D. G. Fisher, James P. Griffin, R. C. Brooks, R. G. Soper, R. W. Van Valkenburgh, C. W. Davis, H. E. Hobson and F. G. Kune, Dallas; F. H. Matthes and A. V. Wainright, Abilene; R. J. Irvine, San Angelo; H. S. Potter, El Paso; J. W. Carpenter, Corsicana; J. E. Cowles, Shreveport, La.; F. N. Lawton, Wichita Falls; P. A. Rogers, Denison, and V. W. Berry, Fort Worth.

Finance committee: C. E. Calder, R. J. Soper and D. G. Fisher, all of Dallas.

Section chairmen: Light and power section, A. V. Wainright, Abilene; street and interurban railway section, Burr Martin, Dallas; gas section, K. L. Simons, El Paso.

Patriotism and Accidents


Your Country Calls

for the loyalty, assistance and support of every man, woman and child

Carelessness may result in death or disabling injuries with consequent loss of service to the United States of America

Therefore, to prevent any accidental injury is a positive form of patriotic action as well as a moral, a humane and an economic duty

Remember your co-operation is [illegible] to prevent accidents to yourself and others

Keep your safety always in mind

PITTSBURGH RAILWAYS COMPANY
DUQUESNE LIGHT COMPANY
BEAVER VALLEY TRACTION CO.

PATRIOTIC AND SAFETY-FIRST PAMPHLET, PITTSBURGH RAILWAYS

As a convenient record of important state papers and as a reminder that patriotism and safety-first have something in common, the Associated Bureaus of the Pittsburgh (Pa.) Railways and its affiliated companies have issued to the public the attractive twenty-four-page pamphlet (4 in. x 8½ in.) shown in the accompanying illustration.

This pamphlet contains the complete text of President Wilson's address before the joint session of Congress, when he called for the acceptance of the gage of battle with Germany. It also contains his appeal to the American people to "speak, act and serve together," and the text of his proclamation defining treason and the penalties therefor.

The cover of the pamphlet, which carries the personal application, emphasizes the fact that the prevention of accidental injuries is a patriotic action as well as a moral, humane and economic duty. A note was placed in the pamphlet to the effect that copies may be secured by addressing the Associated Bureaus.

Principles in Computing Depreciation of Plant

British Engineers Prefer Sinking-Fund to Straight-Line Method—Summary of the Conclusions Reached by the Authors

A RECENT issue of the *Journal* of the Institution of Electrical Engineers contains a paper on "Principles Involved in Computing the Depreciation of Plant," by F. Gill and W. W. Cook. This paper is an attempt to get at a first principle sufficiently sound to be worthy of general adoption for British companies, and as such will be of interest to electric railway officials in this country.

To avoid misunderstandings, the authors define "depreciation" at the outset. They interpret it as: "(1) Provision for the diminution in value of plant in place and working (that is, its loss in value to the owner as a continuing plant), by reason of causes outside his control, such as age, wear and accidents; this provision is called 'renewals.' (2) Provision to enable the owner to take plant out of commission before its physical life is exhausted in cases where, from either progress of the art or growth of the business, it is economically advisable to do so (that is, by reason of causes within his control); this provision is called 'improvements.'"

The various methods of computing depreciation charges are discussed in detail, tabular and other information being presented for each one. The following conclusions are reached:

METHODS OF COMPUTING DEPRECIATION CHARGES

"There is only one common method for the financier, the accountant, and the engineer. This common method is the best studied in the annual charges for plant, determined in advance of construction. To determine the amount in the annual charges for depreciation it is necessary to estimate the first cost, residual values, and the physical and economic lives of the various classes of plant. It is also necessary to fix the treatment of the capital account and to estimate the charge for return on capital. The interest to be earned by the reserve funds must be credited to its source.

"The reserves are preferably handled by means of two funds, as follows: (a) A renewals fund for providing the necessary money at the end of the physical life; that is, the end of the period during which the plant will give its service satisfactorily under all conditions outside the owner's control. (b) An improvements fund for providing sufficient additional money to enable the plant to be taken out of commission for reasons within the owner's control, and while it is still giving its service satisfactorily.

"The calculation of the amounts to be contributed to these two funds must include the interest which should be earned by the money before it is required at the end of the life. The amount, calculated as above, which should be in the renewals fund, gives the correct diminution in value, when considering the value to the owner, of the plant in place and working at any period in its history. The amounts, calculated as above, which should annually be put to the two funds, renewals and improvements, determine the correct depreciation charge against the undertaking for the purpose of assessing profits, fixing rates and, under certain conditions, assessing the value of an undertaking as a going concern.

"The sinking fund method fulfills all the requirements. The straight-line method does not. All estimates, such as first cost, physical and economic lives, and interest earned by funds, will require revision from time to time, either as a result of experience or of changes in conditions."

Forecast Traffic at Duluth, Minn.

Studies Reveal Influences of Precipitation, Wind, Temperature and Cloudiness on Traffic

INVESTIGATIONS undertaken at Duluth, Minn., with a hope of merely demonstrating positively that weather conditions influence passenger traffic to a greater degree than ordinarily supposed have revealed the fact that traffic may be forecast within a reasonable degree of accuracy. The methods employed and the results obtained are described by Eugene Van Cleef in the issue of the *Geological Review* for February, 1917. Duluth was selected for this study, as many people walk to and from work and because the writer was familiar with that city.

The weather during 1914 was not unusual; no strikes occurred and the "jitney" had not been developed. It was decided to base the comparisons on temperature, precipitation, wind, velocity and cloudiness. Humidity combined with excessive heat or cold winds is uncommon in the locality where the study was made and was not taken into consideration.

Average conditions for both morning and afternoon were recorded and, in the case of temperature, figures were taken at times when the traffic is heaviest, namely, 7 a. m., 12 noon, and 6 p. m. These conditions were plotted to scale and grouped according to similar days of the week. The average number of passengers for similar week days were also recorded, the year being divided into four divisions commencing with the months December-January-February. From the collected data, 100 forecasts were made covering a period from March to July, 1914, inclusive, 79 per cent of which involved an error of less than 5 per cent.

From an analytical study of the statistics and charts, the various factors assume the following order in degree of magnitude for reducing traffic: (1) Precipitation accompanied by wind; (2) precipitation alone, except light snow; (3) a considerable drop in temperature accompanied by a moderate to strong wind; (4) a strong wind, but most effective when in combination; (5) a decided drop in temperature regardless of other elements.

Projected Electric Tramway in Australia

A report by a firm of consulting engineers on the proposed electric tramway from Toorak road, South Yarra, to Clifton Hill Railway station, gave the estimated cost at $844,298; estimated revenue, $204,686; estimated expenditure, $195,550, and surplus revenue over expenditure, $9,152, according to the *Melbourne (Australia) Age*. The approximate length of track is 3.9 miles. The permanent way and overhead construction would be similar to that adopted by the Prahran-Malvern and Hawthorn tramway trusts. Power would be obtained from the Melbourne Electric Supply Company. Provision is made for ten single-truck and ten bogie cars capable of carrying forty and sixty passengers, respectively, and these would be housed at the Hawthorn Tramway Trust's depot, Hawthorn. An approximate population of 46,700 would be served by the tramway. The engineers expressed the opinion that the proposed tramway would supply a great public need, and set down the cost to each municipality as follows: Prahran, $202,704; Richmond, $320,543, and Collingwood, $321,050. Among the items of estimated expenditure are: New bridge over Yarra, $137,895; construction of double track, $234,374; altering water mains, $82,890; overhead construction, $43,655; cars, equipment, etc., $276,789.

Electric Railways in War Time

Further Comments on Canadian Activities and Experiences Are Presented, Together with Notes on Conditions in the United States, Where the Movement Toward Increased Agricultural Production Is Growing—Women Conductors Are Being Seriously Considered in Many Cases

IN the rapidly-moving series of events which the war has brought before the electric railway industry two features stand out most prominently at the present time. The more important of these is the wide extent to which electric railways have entered into the national movement for increased production of foodstuffs, and to this end a great variety of methods appear to have been adopted. These range from the mere granting of permission for employees to cultivate unused land owned by the company, through different co-operative arrangements whereby the company supplies seed or does the plowing, and include cases of the railways themselves doing all the work of cultivation with the idea of selling the produce to employees at cost. In all accounts of such plans the need for prompt action is sounded—obviously because the time available for planting garden truck for this summer's crop is growing very short.

The other feature that has assumed particular prominence in the recent developments has been the interest displayed in employment of women conductors. In no case, of course, has this reached the point where women have actually been thus placed upon electric railway cars in this country, and as a matter of fact it has hardly gone far enough to warrant any certain prediction that women conductors will be introduced in the near future. But the number of companies giving serious consideration to the possibility makes the subject worthy of serious thought. As described in the ELECTRIC RAILWAY JOURNAL for May 5, women conductors have been successfully introduced in Canada, according to the report of one company operating north of the border, and it must be remembered that Canadian practice and operating conditions are very similar to those obtaining on the electric railways of the United States.

COMMENTS ON THE WAR FROM CANADA

Among the other reports on war-time conditions that were received from electric railways of Canada in connection with last week's article was one from Wilford Phillips, manager Winnipeg Electric Railway, who made extended comments of special interest on the general situation in the large Western city of Winnipeg. These comments are published in part herewith as an additional means for visualizing the progressive results of the Great War upon a country that is, like ourselves, far removed from the actual front:

"I have great pleasure in complying with your request for an outline of electric railway conditions in Canada since the war, and trust that the experience of this company may be of some assistance to our allies in the United States.

"When war was first declared in August, 1914, the Winnipeg Electric Railway Company was in a prosperous condition; its men were efficient and well satisfied. Our first step after the declaration of war was to place armed guards at our own expense at strategic points on the company's system, guarding the power houses, gas works, etc., to prevent any alien enemy from interfering with our operations. These guards are still on duty, and up to the present time we have had no trouble in this connection.

"Almost immediately after war was declared the governments of France and Great Britain called their reservists to the colors, and a large number of our oldest and best men left us, practically without notice, to take

RECRUTING CAR OF OTTAWA ELECTRIC RAILWAY WITH RECRUITS OBTAINED DURING ONE SUNDAY AFTERNOON TRIP their places at the front. Volunteer battalions were formed, and the company did everything in its power to assist recruiting among its employees. When we compiled our Honor Roll recently we found that more than 30 per cent of our men had left us for active service, coming from all departments of the company. [This Honor Roll as of March 31, 1917, contains 560 names, of which 517 had been accepted by the government. About 220 of the men were in battalions formed early in the war and have seen much active service, and of these twenty-six have been killed in action or have died of wounds; thirty-eight have suffered disabling wounds or shell shock, while five have returned because of sickness or injury. Only three out of the 220 men have been taken prisoner!—EDS.]

"An efficient provincial organization was formed for the purpose of taking care of soldiers' dependents during their absence at the front. This company and its employees during the first twelve months of war supplied approximately $20,000 to the Manitoba Patriotic Fund, and since then have subscribed additional large sums from time to time. The fund is now in a splendid financial condition, and finds practically no difficulty in doing its work satisfactorily.

"The following table showing revenue passengers carried and car-miles operated by this company for the month of March for each of the past five years will show the progressive effect of the war upon our traffic:

	Revenue Passengers	Car-Miles
Month of March, 1913........	4,884,609	698,505
Month of March, 1914........	4,992,593	706,617
Month of March, 1915........	4,419,031	833,808
Month of March, 1916........	5.291,960	906,960
Month of March, 1917........	5,120,533	873,466

"Immediately after war was declared many large industries, owing to their inability to obtain funds, were obliged to close down. Construction of almost every kind ceased entirely, as it was thought that every available cent should be devoted to the prosecution of the war. I believe that more than 20,000 men out of a total population of approximately 200,000 have left the city of Winnipeg. In many cases these men have been followed by their families, or their families have moved away to other places. Although there is a natural increase in the population, and new people are continually coming in, we find there is an actual large net decrease and this naturally has its effect on traffic.

"Large numbers of soldiers during the winters of 1914-1915 and 1915-1916 were, of course, in barracks in Winnipeg, and this caused an increase in traffic. But all went into camp in the summer months, and the sudden withdrawal of large numbers of men from the city caused a decided depression in business and consequently in our receipts.

"The advent of the jitneys has also had an effect, and a very substantial one, on our traffic. Had it not been for the war we are strongly of the opinion that many of the jitney drivers would have been able to find more profitable employment and would not have gone into the jitney business. But owing to the war and the general depression which followed it, many large industries ceased construction work, as stated above, through inability to procure new capital, and many men were thrown out of employment. These men, together with real estate agents and other local men whose employment ceased because of war conditions, became jitney drivers and were licensed by the city.

"Naturally the increase in the number of automobiles operating on the streets in the city caused a very large increase in our automobile accidents.

"Our motormen and conductors are paid a graduated wage scale, and we have noticed a steady rise in the average wage per man-hour. This we attribute to the fact that men enter our service, stay with us a few months or a year, and then enlist, while those married men with families, or men who for personal reasons did not wish to enlist, stayed with the company because they were unable to find as reliable and profitable employment elsewhere. At the present time more than 60 per cent of our man-hours are worked by the men who have been with the company more than three years.

"I feel honored by your request for advice for the electric railways of the United States. If I could offer any remark to this end, it would be that the electric railways go to war with all their might and place every cent of their resources and every man in their employment at the disposal of the authorities until such time as the war is successfully concluded. If this is done, we need have no fear for the future, as that will take care of itself."

RETRAINING DISABLED SOLDIERS IN CANADA

A feature of another report, which was sent to this paper by A. G. Graves, Commissioner of Public Utilities, City of Calgary, Canada, was an explanation of the means taken by the Canadian government for providing returned soldiers with occupations. In part Mr. Graves states: "I might mention that the military authorities have about 200 men in the Ogden Military Hospital which has been established at the end of one of our car lines, some 4 miles from the center of the city. These men have been wounded at the front and have returned, being now in all stages of convalescence. Many of them are entirely unfitted to follow their former occupations. Consequently the provincial government has established a school of technology and art in the city of Calgary, and all returned soldiers who desire it are being taught some trade or calling so as to enable them to become self-supporting. The street railway transports these men to the hospital and school and return at the price of one fare.

"Furnishing occupations for returned soldiers is probably one of the greatest after-the-war problems that this or any country will have to face. In Canada it was soon found that from 10 per cent to 30 per cent of the soldiers that returned from the front, owing to wounds or illness contracted in the service, could not take up their previous callings. Consequently, in each province of the Dominion a committee composed of leading business men was formed to make provision for examining and training these men in new vocations. At the present time about 200 soldiers, or say 10 per cent of the total number from this province who have returned from the front, are being trained in about twenty different occupations. These include office work, wood carving, poultry raising and gardening. There is also a school of agriculture for those who have shown a preference for farming. The bulk of the training is being carried on at the Provincial Institute of Technology and Art, which started operations in September, 1916. Here the soldiers are given shop work involving repairing and handling of machines and engines, as well as instruction in electricity, chemistry, mathematics and business correspondence. The course lasts for eight months and the soldier and his family are kept by the government for that time. At the end of this course each man is practically guaranteed a position in his chosen occupation.

"The employment of the returned soldier is not a serious problem at present, but as soon as peace is declared and demobilization begins, a more serious problem will confront the Dominion. Fortunately many of the firms will provide positions for those who return, and the government will probably begin large undertakings, such as permanent roads, building of docks, etc., which will absorb a great deal of labor. At the present time plans are on foot to provide each returned soldier who wishes to go on the land with 320 acres and a loan of $1,500. If land can be procured adjacent to railway facilities, there is no doubt that many veterans will take advantage of it."

In connection with the percentage of enlistments of electric railway employees, figures have been received from L. A. Thornton, city commissioner, City of Regina, Canada, which show that the withdrawals of the employees from the service of the local municipal railway through enlistment was 35.5 per cent—apparently a maximum for the Dominion. Of these withdrawals, 37.8 per cent were conductors and motormen, while 28 per cent came from the other classes of electric railway employees. These figures apply to enlistments only. Mr. Thornton states that, for replacements, men have been employed at the lowest rates in the schedule, and this has somewhat compensated for the loss in efficiency due to the inexperience of the newer men. He advances the interesting theory, however, that all of the railway employees have increased in efficiency since the beginning of the war. This is because there has been a universal tendency to take more interest in serious matters, and fortunately that attitude has been generally extended to the details of daily work.

STIMULATING AGRICULTURE

The movement on the part of the electric railways in the United States to assign unused land, especially that along the right of way, to employees for the purpose of cultivation has, as previously remarked, gained strength during the past week, and in other ways also the railway industry is exhibiting a very definite interest in the vitally-important matter of increasing our food production. The Pennsylvania Railroad has had a booklet printed under the title "Raise Potatoes and Help Win the War," and is about to distribute it to farmers and to residents in towns and suburbs along its line. The booklet, which is in vest-pocket size, is most interestingly arranged and illustrated. It is a condensation of a special bulletin on potato culture that has been issued by the department of agriculture of the commonwealth of Pennsylvania, and it sets forth the most approved methods followed by scientists and practical growers for successfully producing this crop.

In its introduction the booklet states: "Potatoes are eaten universally. They are healthful, sustaining and satisfying. They have the very great advantage that, if proper methods of cultivation are followed, enormous yields are obtainable from a given area of ground. From 300 bushels to 500 bushels can be raised from a single acre by care and skill. Potatoes are, therefore, particularly adapted to meeting the emergency created by the scarcity of food resultant upon the war. All Americans who can should raise potatoes this summer. Every potato produced before next fall will be more effective in the cause of the United States and her allies than a bullet."

The booklet is being distributed to station agents and to the freight traffic department of the Pennsylvania Railroad at Broad Street Station, Philadelphia, Pa.

Among the interurban railways of the Middle West, the St. Joseph Railway Light & Power Company, St. Joseph, Mo., has undertaken the plan of entering, itself, the business of raising garden truck. Recently the company began work with four teams and plows to prepare the soil on its Savannah interurban right-of-way for the planting of potatoes. About 50 acres will be available for cultivation on the length of the line, and the company may even rent an equal acreage, and plant this also with potatoes. The crop will be sold to the employees of the company at the cost of labor and seed, the company itself handling all farming operations.

On the Waterloo, Cedar Falls and Northern Railway, the employees have been asked to make application to the superintendent for any of the company's land that they may desire to cultivate. This opportunity has been limited to the period prior to May 15, and employees are not allowed to request ground unless they or the immediate members of their families desire to use it. The practice of requesting ground and assigning it to another not an employee of the company, either with or without payment, is positively prohibited. The company also is sending to each employee a pamphlet on scientific gardening. This was furnished through the courtesy of W. L. Clark, vice-president, Illinois Central Railroad, who is greatly interested in the movement for increased food production and is doing everything in his power to accelerate it.

The Northern States Power Company of Faribault, Minn., has entered the movement by donating seed and several acres of land to employees. The company will do the plowing and otherwise aid the movement in every possible way. Similarly the Union Traction Company of Indiana, which holds a very considerable amount of land in Anderson in addition to its right-of-way, is strongly encouraging the movement and all of this ground is to be apportioned out at once to employees who wish to cultivate it. The company has also donated forty-four city lots, to which it holds title, to the Chamber of Commerce of the city of Anderson, and already nearly 100 citizens have made application for pieces of this ground for truck-gardening purposes.

Officials of the Tri-City Railway & Light Company, operating in one of the rich agricultural districts of the State of Iowa, estimate that the yield of potatoes from the sections of the right-of-way that are now under cultivation will be nearly 7000 bu. for the year. Practically all of the ground adjoining the tracks from Muscatine to Clinton, a stretch of approximately 70 miles, is to be utilized except where the tracks pass through towns or where crops cannot be raised.

About 100 employees of the Public Service Commission for the First District, New York, have leased 35 acres of land on Long Island, and each member of the group has volunteered to devote at least one week of his vacation period to the putting in and harvesting of the crops upon this farm.

REVIVES PLAN FOR HANDLING FREIGHT IN CITY STREETS

Managers of the various traction properties of the Cities Service Company have been instructed to investigate the possibility of hauling freight at night by electric railways as a means for reducing the cost of living. H. L. Doherty, president of the company, recently returned from extended visits to Toledo, Kansas City and other middle western points convinced of the feasibility of this plan. He considered that a primary move to make the idea a success would be the starting of an extensive educational advertising campaign in each city, which would tend to show the public the benefits of the innovation and consequently pave the way for legislation necessary to amend franchises not now permitting this form of traffic. A serious duplication of handling small loads and consequent waste exists in the facilities for handling food supplies, and it is believed that the hauling of freight at night on street car tracks will not only eliminate the congestion on city streets, but will carry the corporation out to the farmer so that it buys from him on the spot and so eliminate the intermediate toll of delay and waste.

Night freight hauling by electric lines need not be limited to food, according to Mr. Doherty, as it could also include such commodities as coal. In many instances coal dealers must haul coal from distant pockets to the consumer during the day, which increases traffic congestion on the streets. The location of coal pockets near the distributing centers would do much to eliminate this wasteful procedure, as the coal could then be served to consumers as needed in their immediate neighborhoods.

The public utility properties operated by the Doherty interests already have nearly 2000 acres of potatoes and other food products under cultivation, with the idea of selling the products to employees at cost. This, it is thought, will net a larger production than is necessary for the employees, and plans are now being drawn for the general marketing of the surplus products.

WOMEN CONDUCTORS SERIOUSLY CONSIDERED BY SEVERAL ROADS

Since the recent announcement of the Boston Elevated Railway that it was likely to make use of women conductors as a means for replacing the platform men who may be drafted into military service, no less than fifty women have applied for such positions. However, the company has no definite plans for hiring women conductors at present, and all that the road's employment office has done has been to take the names and addresses of the applicants, pending further developments in the situation. Most of the applications have come in by mail, but a few young women have applied personally.

Two roads have definitely announced that applications were desired from women to act as conductors. One of these is the Corning (N. Y.) & Painted Post Street Railway. One-man car operation was tried on this line recently but was discontinued owing to the opposition of the public. The company is now planning to secure women to serve as conductors upon four runs during off hours for the purpose of determining how the plan will work out in practice.

Another company which has definitely solicited applications from women is the Beaver Valley Traction Company, New Brighton, Pa. While it is not the intention to instal women immediately, the company has announced that the shortage of labor and the desire of the company to avoid a tie-up of the transportation facilities of the Beaver Valley have made it advisable to have applications from women for this service on file.

MISCELLANEOUS NOTES

In recent issues of *Electric Railway Service* and *The Electrogram,* published respectively by the Detroit United Railway and the Puget Sound Traction, Light & Power Company, there have appeared appeals for recruits for service with the colors. These include statements from local recruiting officers for the army, navy and the marine corps, calling attention to the opportunities offered in the way of adventure or advancement to be obtained in the various arms. In addition these publications printed an appeal from the Red Cross organization.

Plans for reinstatement of employees drafted into the army have been decided on by the Waterloo, Cedar Falls & Northern Railway, and have been published in the following bulletin: "All employees of this company who enlist voluntarily in the army or navy of the United States or are drafted under the selective conscription plan are assured by this company that their seniority as employees will be preserved. At the termination of the period of their governmental service and when they are mustered out of such service they will be reinstated in their positions with this company, and their service with this company will be considered as continuous from the time they first entered its employment."

Owing to the imminent coal shortage that is faced by a number of electric railways, the recent establishment by the government of a national committee on coal production is of interest. F. S. Peabody, president Peabody Coal Company, Chicago, has been designated as chairman of the committee and has opened offices at the Interior Building at Eighteenth and F Streets in Washington, D. C.

Publication of bulletins outlining the work done by the steam railroads' special committee on national defense has been begun by the American Railway Association. The first bulletin describes how the railroads of the country will be operated during the war under the plan of pooling all railroad interests and placing the direction of the resulting continental railroad system in the hands of an executive committee composed of five railroad presidents, a member of the Council of National Defense and a member of the Interstate Commerce Commission. Fairfax Harrison of the Southern Railway System is chairman. This plan of operating the country's railroads covers all classes of service—that which is conducted on behalf of the public as well as that for the government.

Meeting of N. E. L. A. in New York

Electric Lighting and Power Men Hold Enthusiastic Gathering on Short Notice in Place of Usual Convention

THE National Electric Light Association held its fortieth annual convention in New York City on May 9 and 10. It has been customary to hold the meeting in June, but on the outbreak of the war it was decided not to hold a meeting of the usual type but promptly to convene for the discussion of the pressing problems of the day.

In accordance with the purpose of the meeting the time was all taken up with addresses of patriotic import and the routine business essential to the proper working of the association. It was decided that the papers and reports which had been prepared for presentation at the June convention should be admitted to the proceedings after they had been passed upon by a special committee consisting of Secretary T. C. Martin and the chairmen of the several sections. The section chairmen were continued in office for the coming year. A summary of the reports which are of special interest to electric railway men will be abstracted in a later issue of the ELECTRIC RAILWAY JOURNAL.

The election of officers and members of the executive committee resulted as follows: President, J. W. Lieb, New York Edison Company; first vice-president, W. F. Wells, Edison Electric Illuminating Company of Brooklyn; second vice-president, R. H. Ballard, Southern California Edison Company; third vice-president, Samuel Scovil, Cleveland Electric Illuminating Company; fourth vice-president, D. H. McDougall, Toronto Power Company; treasurer, W. H. Atkins, Edison Electric Illuminating Company of Boston; executive committee, Paul Spencer, United Gas Improvement Company; Walter Neumuller, New York Edison Company, and E. W. Lloyd, Commonwealth Edison Company of Chicago.

SPIRIT OF THE MEETINGS

The addresses by some of the most eminent men in the industry reflected a splendid patriotic spirit. They showed that the men in the lighting and power field realize the responsibility resting upon them by virtue of their intimate relation to the every-day work of the nation. The addresses contained many statements to demonstrate that the companies are alive to the necessity for being ready to produce much greater outputs of reliable power, for placing their technical talent at the disposal of the government, and for furnishing their full quota of men at the front without unnecessary hardship to the employees' dependents. Typical of the spirit of the gathering were the remarks of one speaker who said: "The man who makes up his mind to lay down his life for his country wants all the encouragement to go to war that he can get. He goes because he considers it a duty to go, and I consider that every man who is allowed to stay at home should be thankful if he is in any way able to do anything, and he should consider it a great privilege that he is allowed to stay at home. Every man who is selected wants all the encouragement and enthusiasm put behind him that is possible, no matter how he is selected."

Traffic Notes from San Antonio

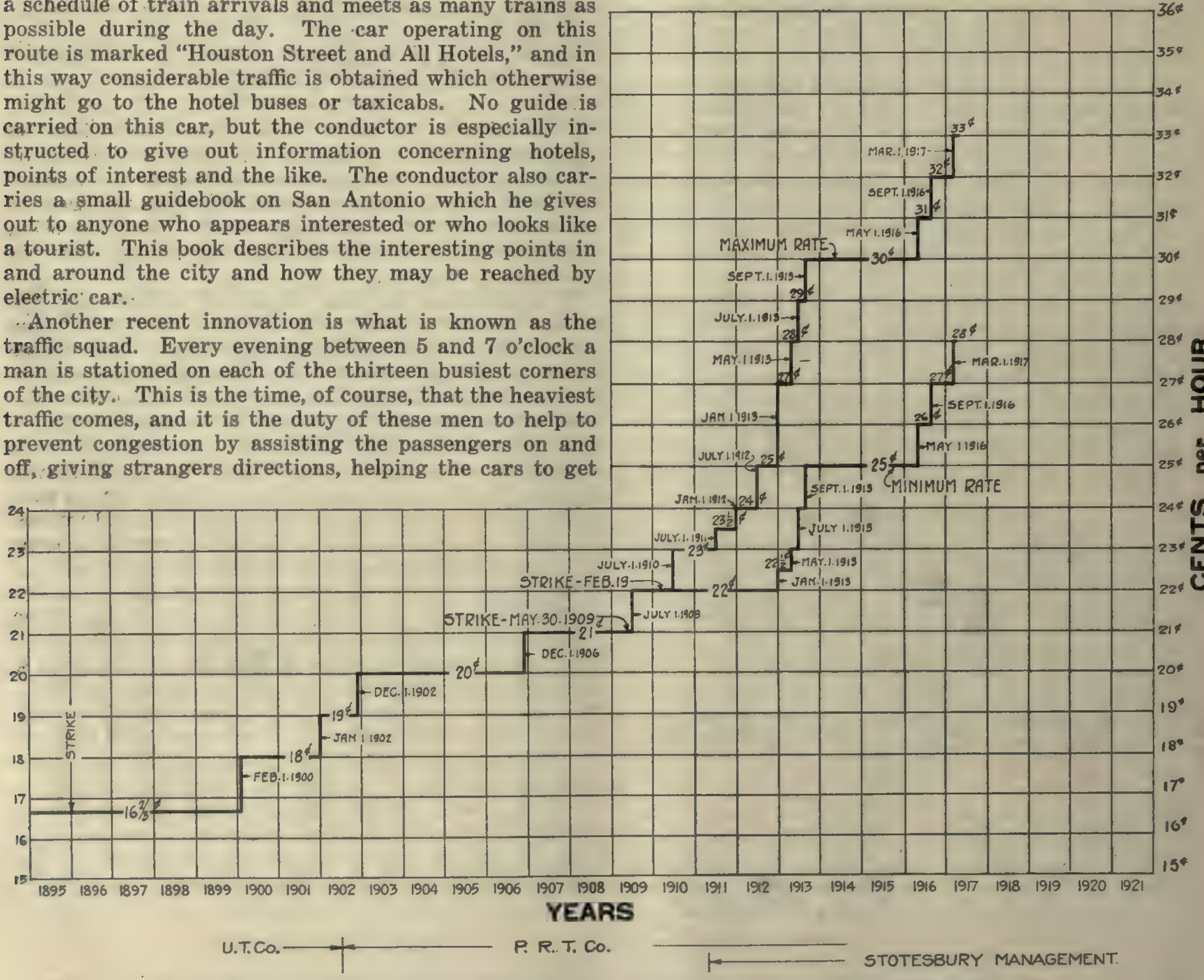
The San Antonio Traction Company has several methods for developing city traffic. One of these is the operation of a special car between the three railroad stations and the hotels in San Antonio. The crew has a schedule of train arrivals and meets as many trains as possible during the day. The car operating on this route is marked "Houston Street and All Hotels," and in this way considerable traffic is obtained which otherwise might go to the hotel buses or taxicabs. No guide is carried on this car, but the conductor is especially instructed to give out information concerning hotels, points of interest and the like. The conductor also carries a small guidebook on San Antonio which he gives out to anyone who appears interested or who looks like a tourist. This book describes the interesting points in and around the city and how they may be reached by electric car.

Another recent innovation is what is known as the traffic squad. Every evening between 5 and 7 o'clock a man is stationed on each of the thirteen busiest corners of the city. This is the time, of course, that the heaviest traffic comes, and it is the duty of these men to help to prevent congestion by assisting the passengers on and off, giving strangers directions, helping the cars to get away, assisting in case of accident, etc. At certain places also where there are no electric switches these men turn the switches and thus speed up the line. The plan has met with much favor, both with the public and with the regular car crews.

Increasing Labor Costs

IN the ELECTRIC RAILWAY JOURNAL of April 7, page 643, there was presented an abstract of Director W. S. Twining's analysis of the Philadelphia Rapid Transit Company proposal for the operation of new city-built high-speed lines in Philadelphia. In connection with this analysis Mr. Twining presented various reasons why the city should exercise caution in guaranteeing a preferential to the Philadelphia Rapid Transit Company for a long period.

One reason cited was the diminishing profits in the street railway business. During the last fifteen years, Mr. Twining said, the cost of street railway service per passenger has increased greatly. Wages, for example, now constitute 62 per cent of the operating expenses, and future wage scales are of the greatest importance. To illustrate how wages had increased, he presented the accompanying chart, which shows in a striking way the rise in trainmen's wages in Philadelphia since 1895.



MAXIMUM AND MINIMUM WAGE SCALES OF PHILADELPHIA RAPID TRANSIT SYSTEM FROM 1895
(ELEVATED MOTORMEN 3 CENTS PER HOUR MORE THAN ON THE SURFACE LINES)

Extension of London Underground System

Subway Equipment with Unusual Features of Body Design and Electric Control Is Operated Over an 8-Mile Section of the London & North Western Railway Tracks to Give Through Service Between the Suburbs and the Center of the City

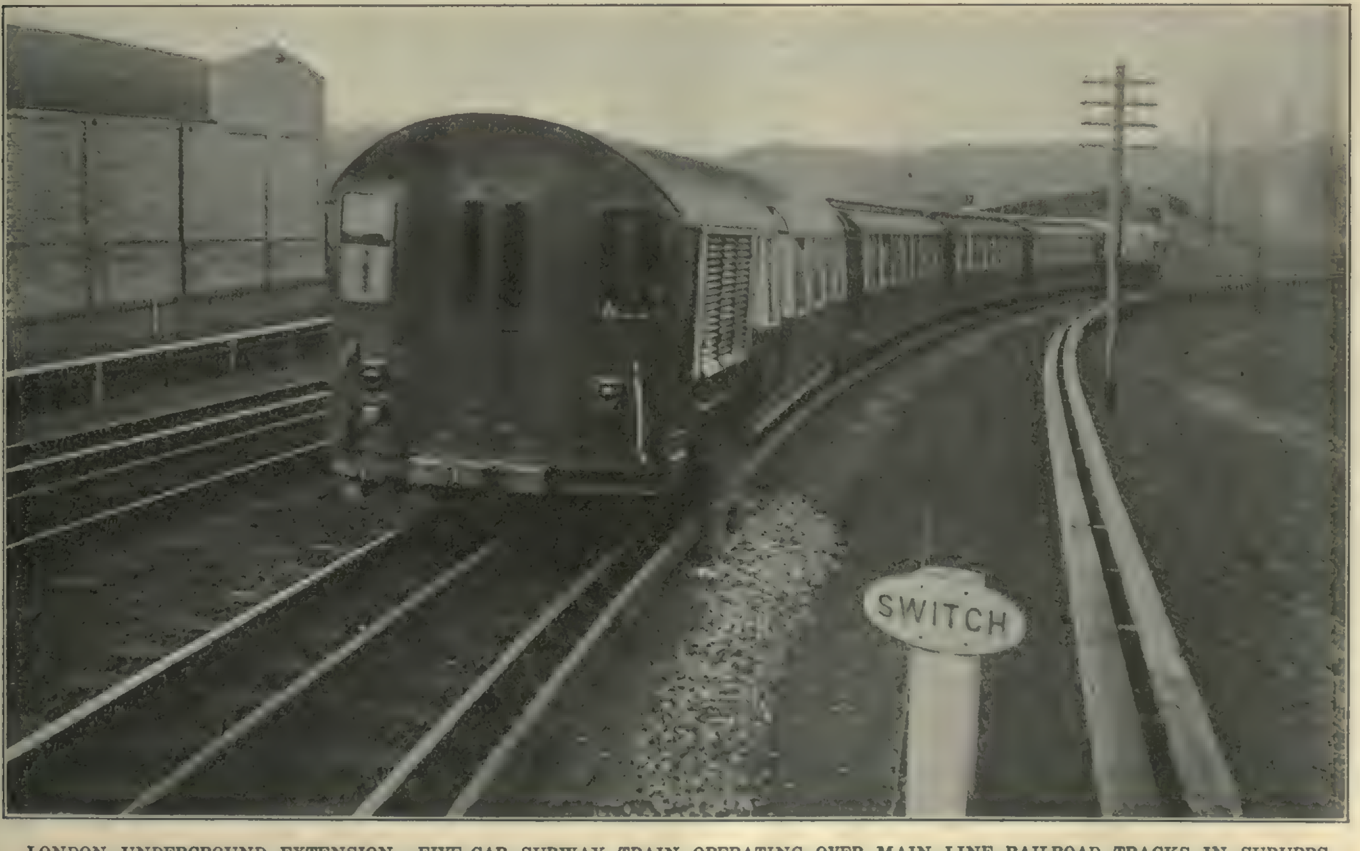
RECENTLY there has been placed in service an extension of the Bakerloo underground line in London, England, which will open up a large area of new countryside and residential districts, and will directly connect the northern suburbs with the central, west end and southeastern districts of the city. In part, the tracks of the London & North Western Railway are used, and this will give the passengers of this system a choice of some five terminal stations in town connecting with main-line railways. The new extension is about 8 miles in length. It runs above ground for this distance, although the cars to be used upon it are, of course, designed for subway service, since the remainder of the 20-mile route is underneath the surface. Power at 600 volts direct current will be supplied to the extension from the London & North Western power houses at Willesden.

CONTROL EQUIPMENT

As the route makes use, in part, of the tracks of different railway systems of which one employs an earth return while the other employs an insulated return consisting of a fourth rail, it has been necessary to modify the equipment of the motor cars accordingly. For this purpose two additional sets of shoes have been fitted on the motor trucks of the cars, one set on either side. On the trailing truck of the motor car insufficient clearance exists below the body to fit shoes for the fourth rail, so that these have had to be arranged on the truck of the adjoining trail car, connection being made to the motor car by means of jumpers.

For the conversion from earth to insulated return negative switches and fuses to the main circuit and to each of the auxiliary circuits have been provided. In doing this, care was taken to reproduce the standard wiring arrangement of the road that uses insulated return, so that, electrically, the difference between the two types of rolling stock is confined to the control equipment.

The control, which is supplied by the British Thomson-Houston Company, is of the relay automatic type, the contactors being picked up in their correct sequence by the current-limiting relays when the controller handle is placed on the operating point. The principle underlying this method of control is that, after a contactor has been picked up, its coil is immediately transferred, by means of interlocks, to another wire. Thus there are essentially two operating wires, the pick-up wire and the retaining wire, although other wires are introduced for forward and reverse, circuit breaker setting, etc. There are no main bus lines

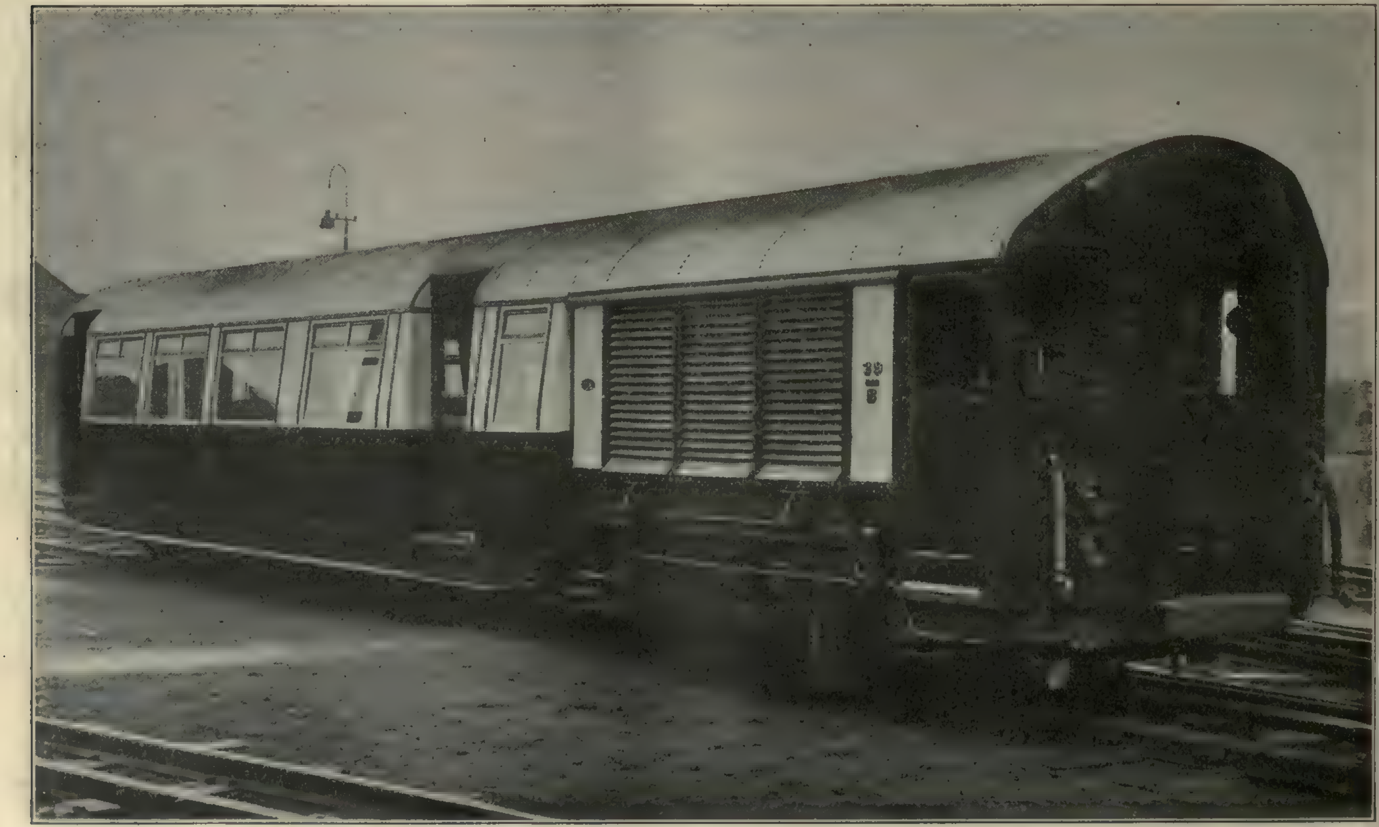


LONDON UNDERGROUND EXTENSION—FIVE-CAR SUBWAY TRAIN OPERATING OVER MAIN LINE RAILROAD TRACKS IN SUBURBS

LONDON UNDERGROUND EXTENSION—GROUP OF WOMEN GUARDS, OR GATE WOMEN, WHO OPERATE THE NEW SERVICE AND ARE SUBORDINATES OF THE MASCULINE OFFICIAL APPEARING AT THE LEFT OF THE ILLUSTRATION

through the train, which is composed of a motor car at the front and rear and three trailers between them. Consequently a potential relay is fitted on each motor car, and this drops all contactors on that car when the shoes lose current. This is necessary because, when no current passes through the main coil of the current-limit relay, it ceases to exercise its control over the rate of picking up contactors.

The controller has four forward points and two reverse points, of which Nos. 2 and 4 are running points where all resistance is cut out. A useful provision in the control is that, if in the course of the automatic notching-up the controller handle is brought back to the first or third notch, as the case may be, the automatic closing of contactors is stopped, but those already closed are kept up. Another feature is the operation of the safety button on the controller handle, which may be released except when at off position. But if the handle itself is let go it flies back to off position, instantly cutting off current and applying brakes throughout the train. Another safety device which is now a part of the standard London Electric Railway equipment is the control circuit governor. By interrupting the control circuit, this prevents the train from

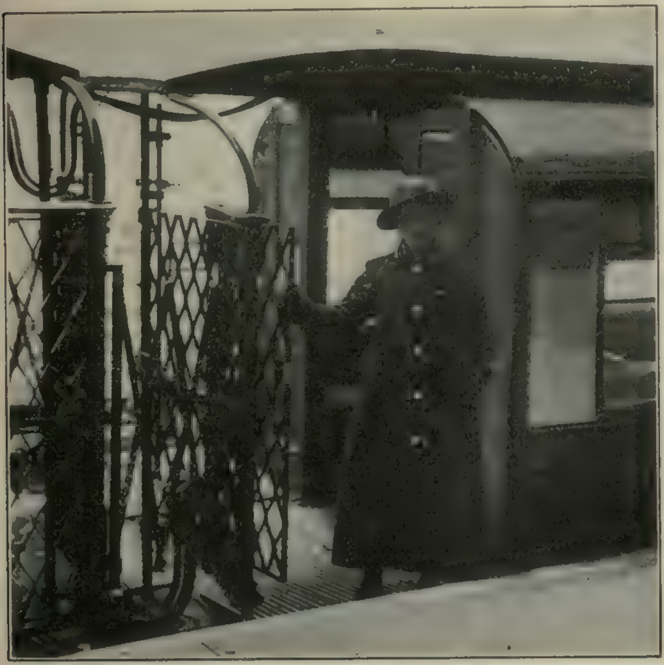


LONDON UNDERGROUND EXTENSION—MOTOR CAR WITH CONTROL EQUIPMENT COMPARTMENT ELEVATED TO CLEAR MOTOR TRUCK being moved forward unless the train pipe of the Westinghouse air brake is charged with air and the trip-cock is cut in.

Each motor car is fitted with two General Electric 212 motors of 240 hp., mounted on the same truck and geared for a free running speed of 35-40 m.p.h.

ROLLING STOCK

As mentioned above, each train consists of five cars, two motor cars and three trailers. The latter are standard London Electric Railway cars, while the motor cars were designed for a new extension over the Great Western Railway, whose opening has been postponed for the time being. The motor cars are provided with covered vestibules at the trailing ends, and they have center doors. They were described in the ELECTRIC RAILWAY JOURNAL for Feb. 7, 1914, page 298.



LONDON UNDERGROUND EXTENSION—VIEW OF CAR PLATFORM AND GATE SHOWING RAMPS DESIGNED TO PROVIDE FOR VARIATIONS IN STATION PLATFORM HEIGHT

This is the first case wherein rolling stock designed for underground service has been run in passenger service on a main line railway, and provision has had to be made for passengers to get on or off at the stations on the London & North Western Railway, which have platforms of the standard main-line height—higher than that obtaining in the underground tubes. This has been accomplished on the trail cars by superimposing short ramps on either side of the existing platforms of these cars. It has been possible to do this without encroaching upon available headroom, owing to the open character of the gangways. But the closed vestibules on the motor cars have prevented any similar provision for this equipment.

The number of seats on each motor car is thirty-two, and on each trailer fifty-two. Third-class accommodations only are provided. The car bodies are constructed of steel, with some wood interior finish. Ventilation is provided by an air duct with perforations which runs for the whole length of the car, and is open to the atmosphere at the ends. The prominent feature of difference from common practice in the United States is the installation of control equipment in a raised section of the body over the motor truck. This is done to save height.

General dimensions and weights of the motor cars are as follows:

Length over all	47 ft. 9 in.
Width over body	9 ft. 8 in.
Total height from rail	9 ft. 3 in.
From center to center of truck	29 ft. 6 in.
Diameter of motor wheels	36 in.
Diameter trailing wheels	29 in.
Weight on motor truck wheels	47,500 lb.
Weight on trailer truck wheels	20,200 lb.
Total weight of car completely equipped	67,800 lb.

The total weight of a five-car train without passengers is approximately 246,000 lb., and the seating capacity is 220 passengers.

New Plan of Pennsylvania Railroad to Secure Help

Under a new plan for handling applications for work, which is now being put into effect by the Pennsylvania Railroad, every one of the 1500 station agents on the lines east of Pittsburgh and Erie will become an employment agent. In connection with this change, what will virtually be an employment clearing house is to be established in the general manager's department at Broad Street Station, Philadelphia. The purpose of the new plan is to encourage the entrance into the service of the Pennsylvania Railroad of men who live in the neighborhood of its lines and shops. It has always been the policy of the company as far as possible, to offer the first opportunities for work to people who are its neighbors. It is the belief of the management that a number of men in the country districts, as well as in the towns, villages and cities through which its lines pass, would welcome the chance to make railroading their career, but in many cases do not know where to apply. The new employment arrangements will make it easy for anyone to make an application and to ascertain what lines of service are open and in what localities work for which he is fitted may be obtained.

Notices will be posted conspicuously at various points along the railroad, directing all persons seeking employment to apply to the station agent. The agent will interview each applicant, learn his capabilities as fully as possible and direct him to the nearest shop foreman, supervisor, trainmaster or road foreman of engines, who may have vacancies at his disposal. If there are no vacancies on the division where the application is made, it will be forwarded to the office of the general manager in Broad Street Station, where it will be handled through the clearing house plan which is to be established there. Under the clearing house plan, each general superintendent will forward, once a week, to the general manager a list showing the number of vacancies on his grand division for shop laborers, car repairmen, car cleaners, engine cleaners, brakemen, firemen, freight handlers, trackmen, etc. By this means every applicant for work can be promptly directed to the nearest point where labor is needed, in case no opportunity exists near his home. This arrangement, it is thought, will greatly aid in equalizing the distribution of labor and the opportunities for work in the railroad service.

Cough Drop in the Fare Box

The following note was on the trip card for March 28 of one of the conductors of the San Francisco-Oakland Terminal Railways:

"Deducted 10 cents from cash, account Mrs. .... of No. ..... Avenue, who dropped a cough drop in fare box with her nickel. I took note of same, and the cough drop came through and registered 10 cents."

More Revenues Sought in New York

Third Avenue Railway Informally Suggests Transfer Change to Commission—Other Companies Considering Increases

RUMORS that the street railways in New York City were planning to increase their fares were confirmed on May 9 by the Public Service Commission for the First District. Although no formal application has yet been made, it appears that the Third Avenue Railway recently suggested to the commission in an informal way that owing to its need for increased revenues the commission might allow it to make a 1-cent charge for transfers.

None of the other companies in the Metropolitan district, it was said, had either formally or informally applied for a higher fare or a transfer charge. It is the opinion of commission representatives, however, that the question of securing larger revenues to meet increases in operating costs is "in the air" for all industries, and the other surface lines in the city will probably sooner or later apply for some form of financial relief. No increase would be granted, however, until the case had been threshed out in public hearings according to law, and until the regular procedure of the commission in rate cases had been followed.

THIRD AVENUE NEEDS MORE MONEY

The attitude of the Third Avenue Railway in regard to increased revenues is shown by a memorandum submitted to Chairman Straus on April 11 by E. A. Maher, Sr., president of the company. This memorandum followed a series of talks between Mr. Maher and members of the commission, in which Mr. Maher asserted that his system was not meeting its fixed charges and would have to find a means of increasing its revenues.

The memorandum, outlining in detail Mr. Maher's position on the subject, stated that there are four methods by which electric railways could hope to increase their income or, if present conditions continue, to prevent the accumulation of constantly increasing deficits. These are as follows: (1) Decreasing the cost of operation, (2) lowering the quality of service, (3) securing decreases in taxation and (4) securing additional allowances above the regular fare for transfers.

In Mr. Maher's opinion, it seemed impossible to make any substantial reduction in operating costs, in view of the increase in nearly all items connected with electric railway operation. Prices of all materials have shown enormous increases, labor has advanced materially and power costs have risen. In regard to lowering the quality of service, Mr. Maher said that there is no reason to suppose that any relief can be obtained in this way. The trend of public demand and of commission orders and recommendations is toward improved service. As for lower taxes, the tendency appears to be toward an increase rather than a decrease, and probably most forms of taxes, federal, state and municipal, will be made much heavier. One indirect form, the expense of paving renewals and replacements, might in all justice be reduced in large part, if not entirely suspended.

In discussing a transfer charge, which in the talks with the commission had been understood to be 1 cent, Mr. Maher said that under past conditions, in connection with service rendered, the 5-cent fare had been perhaps reasonable, but that the fare per passenger is no longer 5 cents. The transfer privilege has been extended so greatly that now the company is confronted with a situation whereby the carrying of more passengers means the loss of more money. Mr. Maher said that the Third Avenue Railway is facing a critical situation, being confronted as it is with constantly increasing costs of operation which it cannot control, and being unable to increase its revenues. It must in the near future spend large amounts for reconstruction and repair work on tracks, and its gross earnings are expected to be reduced, temporarily at least, when the new subway and elevated extensions are opened. In his opinion, therefore, the only relief that can be hoped for is an increase in earnings through a rearrangement of the transfer privilege or a reduction in taxation through the abatement of paving charges.

REPLY OF THE COMMISSION

The attitude of the commission in regard to Mr. Maher's informal memorandum is shown in the following letter of April 26, sent to him by James Blaine Walker, secretary of the commission:

"I am directed to acknowledge the receipt of your letter of April 11 addressed to Chairman Straus, submitting a memorandum dated April 6 on the question of devising means for increasing the revenue of the Third Avenue system.

"On any such question the commission can, under the law, give consideration only to the question of a reasonable return. If consideration by the commission is desired an application should be made formally, setting forth the facts fully, the remedy desired and the reason for such application and the desired remedy. The commission will then consider the matter as set forth under the provision of law."

It is reported that the Third Avenue Railway, in accordance with the foregoing letter, has been preparing a formal application for relief, but no confirmation of this has been issued.

ATTITUDE OF OTHER COMPANIES

Theodore P. Shonts, president New York Railways, states that the officers of the company have discussed means of increasing the operating revenues, but have not reached a decision. Continuing, he is quoted as saying:

"We have considered a 6-cent fare, a 1-cent transfer and a 2-cent transfer, but it would be premature for me to discuss any of these at this time. A serious situation exists and will have to be met by some means. We have had prepared a list of the increases in operating costs this year and they range from 70 to 1100 per cent.

"We know, after the financial survey just completed, that the surface lines are in actual danger unless some means is quickly provided for their relief. The subway and elevated lines are not to be affected. In fact, the 'preferential clauses' in our contracts with the city remove them from any possible connection with the present situation. The directors of the New York Railways are keeping in touch with the situation, but we have not discussed the matter either formally or informally with the commission."

H. A. Bullock, assistant to President T. S. Williams, Brooklyn Rapid Transit Company, expressed the attitude of his company as follows:

"The same situation confronts transportation companies all over the country, and there has been much talk among railroad men of raising the usual fare from 5 to 6 cents. B. R. T. officials have participated in these discussions and have considered it seriously. They have not yet taken up the subject with the Public Service Commission, however, either formally or informally, and there is no certainty as to what they will do about it."

NEW YORK ASSOCIATION MEETS

As this paper went to press on May 11 a meeting was being held at the Hotel Astor of the New York Electric Railway Association to consider the best means of securing relief.

COMMUNICATIONS

The Arch-Bar Truck in City Service

PITTSBURGH RAILWAYS COMPANY
PITTSBURGH, PA., May 9, 1917.

To the Editors:

Referring to S. A. Bullock's article in your April 21 issue on the question of truck equalization, it seems that all are agreed that proper equalization is a desirable feature of truck construction. We are not familiar, of course, with the data from which Mr. Bullock makes the deduction that the well-known arch-bar type of truck produces discomfort to passengers or unusual hammering on the track. The contrary of this statement becomes readily apparent when one takes the time to ride in a car equipped with this type of truck and then immediately afterwards rides in a car which is equipped with any other type of truck having wheels of large diameter.

The contrary of Mr. Bullock's view is also very apparent to those who have taken the trouble to observe equalizer-bar trucks with large-diameter wheels negotiating special work at intersections, either at low or high speed, as compared with a car equipped with the so-called arch-bar type of truck.

With regard to the question of bolster equalization, it may be said that the same system of bolster suspension is used in the equalizer-bar type of truck and the arch-bar type of truck, so there remains no difference in construction between the two types of trucks in this particular.

We take issue with Mr. Bullock in his assumption that the arch-bar truck produces more noise, is less flexible and has more box play than the design with equalizer bars. Practical experience in the use of the arch-bar truck over a period of some seven years proves the contrary to be the case, and this same situation obtains with regard to Mr. Bullock's assumption that this type of truck produces greater distress to the track, truck and body.

With regard to the equalization feature of the side frame, we are in accord with Mr. Bullock's statement that "efficient equalization requires a spring base (or point of support) less than the wheelbase and an equalizer which acts as a lever." If it is essential that the spring base (or point of support) be less than the wheelbase, with the equalizer acting as a lever, the natural inference is that the closer this spring base (or point of support) approaches the center line of the side frame, the more effective equalization is obtained. A maximum of side-frame equalization would be obtained if the bolster was supported on the side frames on knife edges, or if the pivotal point lay at the center line of the truck bolster. As a matter of fact, the so-called arch-bar truck contains this feature through the transom connections. The transoms connecting the side frames are, when properly designed, capable of producing and sustaining without injury the slight torsional movement necessary to produce the required amount of side-frame equalization. It is apparent that Mr. Bullock has overlooked this feature of the arch-bar truck.

On the Pittsburgh Railways we have observed, in practical operation for nearly two years, arch-bar trucks of the type described (with swing-link bolster construction) in high-speed interurban service. In the same service there are trucks of the equalizer-bar type illustrated in Fig. 4 of Mr. Bullock's article. The former truck operates with less noise and discomfort to the passengers than the latter type, and since the former is less than one-half the weight of the latter, it is reasonable to expect that the hammering on the rail joints because of the lighter weight will be less than that of the heavier type of truck.

F. R. PHILLIPS,
Superintendent of Equipment.

EAST LIVERPOOL TRACTION & LIGHT COMPANY
EAST LIVERPOOL, OHIO, May 4, 1917.

To the Editors:

In his article on trucks, which appeared in the ELECTRIC RAILWAY JOURNAL for April 21, S. A. Bullock says that "it is desirable that all trucks be equalized," and since the writer's experience is in support of this statement, the following comments are submitted, these being confined to trucks of the arch-bar construction.

It seems that the use of arch-bar trucks in electric traction was brought about by the light weight made possible with this construction and by their adaptability for low-floor cars, and it is in such service that we are using them.

With the rigid type of construction which involves journal boxes bolted to the truck frame, the axles are parallel to each other so long as track conditions are perfect; but every electric traction line has more or less bad track with its low joints and irregular surface. It is evident that the two axles of a truck cannot remain parallel to each other in passing over such irregular surfaces, for if the truck frame were rigid enough to keep the axles parallel under such conditions one of the wheels would leave the rail when passing over a depression such as a low joint. Since there is no provision for meeting these conditions in the arch-bar type of truck, the truck frame is subjected to constant strain and torsion in order to permit the wheels to follow irregularities in the track.

This constant twisting and strain, together with the vibration transmitted from the wheels because there are no springs over the journal boxes, results in bolts working loose and bolt holes wearing, which means increased cost of maintenance.

We have found that, where trucks have side-frame equalizers, there is practically no trouble with truck frames working loose or wear of bolt holes. The frames of such trucks remain true to the position in which they were erected and require little attention as the flexibility secured by the equalization of both bolster and side frames relieves the truck frame of many of the strains to which it would otherwise be subjected.

We are convinced, therefore, that trucks without proper equalization do not successfully meet the requirements of electric passenger car service.

C. N. PITTENGER, Master Mechanic.

Employees' Service Periods in Iowa

The Ottumwa (Iowa) Railway & Light Company has compiled some interesting statistics relative to the number of years employees have been connected with the company. These records show that out of a total of 116 employees seventy have been with the company five years or more. The complete tabulation is as follows: Two men employed twenty-five years and over, six men employed twenty to twenty-five years, nine men employed fifteen to twenty years, nine men employed ten to fifteen years, forty-four men employed five to ten years, thirty-two men employed one to five years, fourteen men employed less than one year.

A copy of President Wilson's proclamation, calling upon all citizens to "do their bit" in helping to win the war, will be placed in the hands of every one of the 250,000 employees of the Pennsylvania Railroad system.

Practical and Economical Solutions of Problems in
EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Getting Rail-Head Contours

Home-made Scribing Machine for Recording Worn Rail Heads Proves Effective for Rapid Work

BY W. R. DUNHAM, JR.
Engineer Maintenance of Way The Connecticut Company, New Haven, Conn.

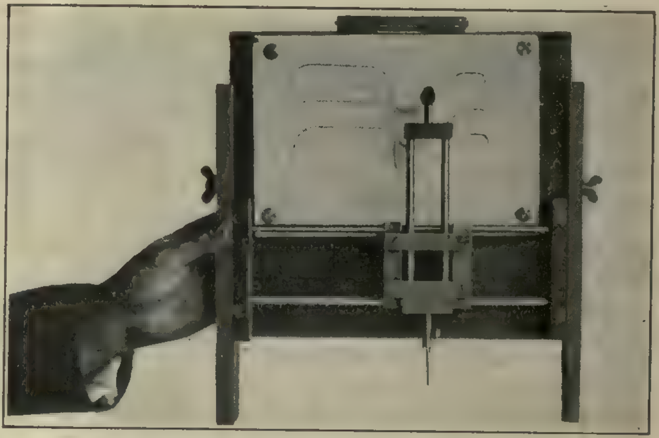
In connection with making scribings of rail heads in pavements to determine the average contour, the only method previously known to the writer before he had to cope with the problem was that of applying plaster of Paris. This seemed to be a slow method where scribings from a large number of rail heads were to be taken. He, therefore, designed and had built in the shops of the company a simple machine which worked out effectively and it seems as though this machine could be used to advantage by other members of the American Electric Railway Engineering Association in investigating not only rail heads but wheel contours.

Briefly, a piece of ½-in. board, 9 in. x 10 in., was used as a drawing board and set vertically with a spirit level on the top to insure the paralleling of the base of the rail and the base of the graph, on the assumption that the base of the rail was horizontal. On both edges were movable legs to permit the setting of the board with the top edge level across the rail to be scribed and to allow for variations in the pavement elevations on either side of the rail heads. At the base of the board two parallel brass rods were attached, these rods running lengthwise and placed ⅜ in. from the face of the board. The purpose of these rods was to furnish a guide for a brass frame moving across the board parallel with the top edge.

This carrier has two brass rods, placed vertically at right angles with the horizontal rods and free to move up and down. At the bottom of these rods provision was made for a long needle point for tracing the contour. The top of the carrier was provided with a pencil point for transferring the outline of the traced surface to a paper attached to the board. The four brace rods and carrier provide for horizontal and vertical movements, permitting accurate contours to be made in one or two minutes each.

A pencil line drawn parallel with the top edge and another near the left vertical edge furnish reference lines for setting the paper. For reference in making the contour, the back edge of the rail can be determined to compare with the original section (as given in the manufacturer's catalog), and also the lip of the tram or groove can be used for a check.

If it is desired to use this device for determining the vertical wear on rail heads accurately it will be necessary to take up enough pavement to permit calipering of the thickness of the head. However, on the rails which we scribed the wear on the trams was so slight that we assumed it to be negligible for our purpose. This was not to determine the amount of metal left in the head but only the form of the contour.



INSTRUMENT FOR TRACING RAIL CONTOURS

The cost of the machine described was trifling compared with the value of the time needed for taking contours with plaster of Paris. Although the writer has never seen an instrument of this kind before making this one, he has since seen a description of one made by Holt of Leeds, England. This, however, gives the section reversed and upside down, while the machine described gives the surface direct. In closing the writer wishes to give credit to his assistant, A. L. Donnelly, and James Dooley, master mechanic of the company, for their co-operation in developing this instrument.

Valuation of Track Special Work

The Author Advocates the Appraisal of Special Work by Elements Rather Than as a Whole

BY A. R. BAILEY
Assistant Professor Civil Engineering, University of Michigan

It has been the practice on many electric railway appraisals to handle all track special work by layouts—that is, by making an inventory of all the layouts of each type on the system and then applying a price per layout. This is a simple method but one that does not seem fair when considered from all possible viewpoints. For instance, if cost of reproduction-new less depreciation is wanted, then for the average property the method would not be fair, either to the public or to the company. This condition of unfairness is sure to result when a flat rate is applied to a layout, which in the great majority of cases is composed of units in varying stages of decrepitude.

Special work layouts are not always renewed in entirety but by piecemeal as the parts wear out. A new switch is installed, later a frog is replaced and so it goes until, if the layout is a large one, many new parts have been added. Originally or at some time perhaps, all the elements of the layout may have been installed at once but they do not wear uniformly; in fact, excessive wear may occur in one element and not in others, which means that the layout will contain at any time parts varying in condition from new to scrap.

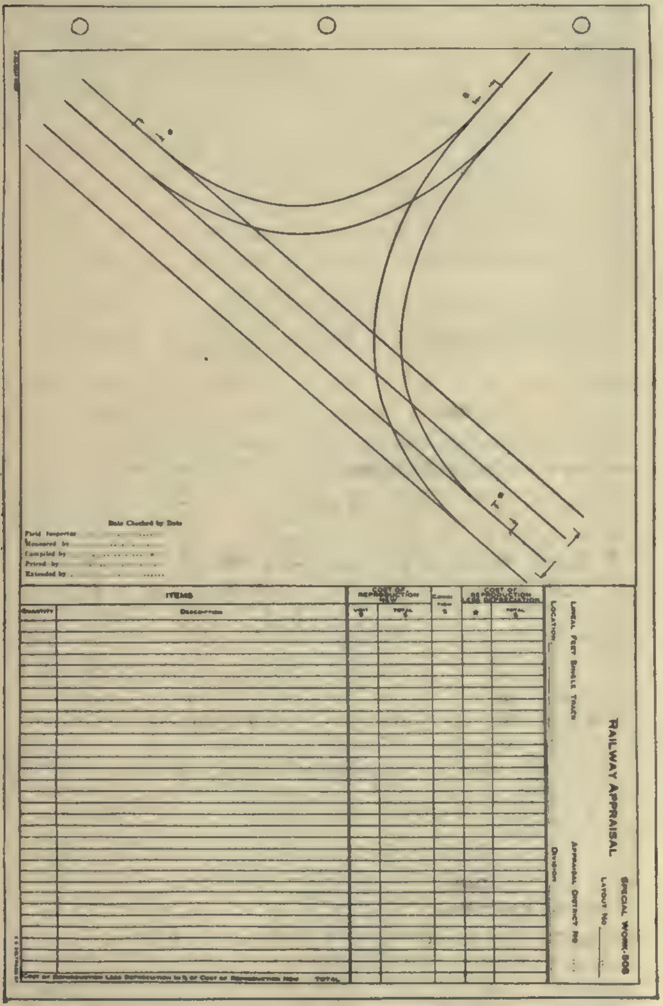
It may be true that considering a property as a whole the total values will be about the same whether the track special layouts have been handled by cost per layout or by the method of treating each part separately. It will be more difficult, however, to substantiate the former method in court or before a commission than it would be the latter method.

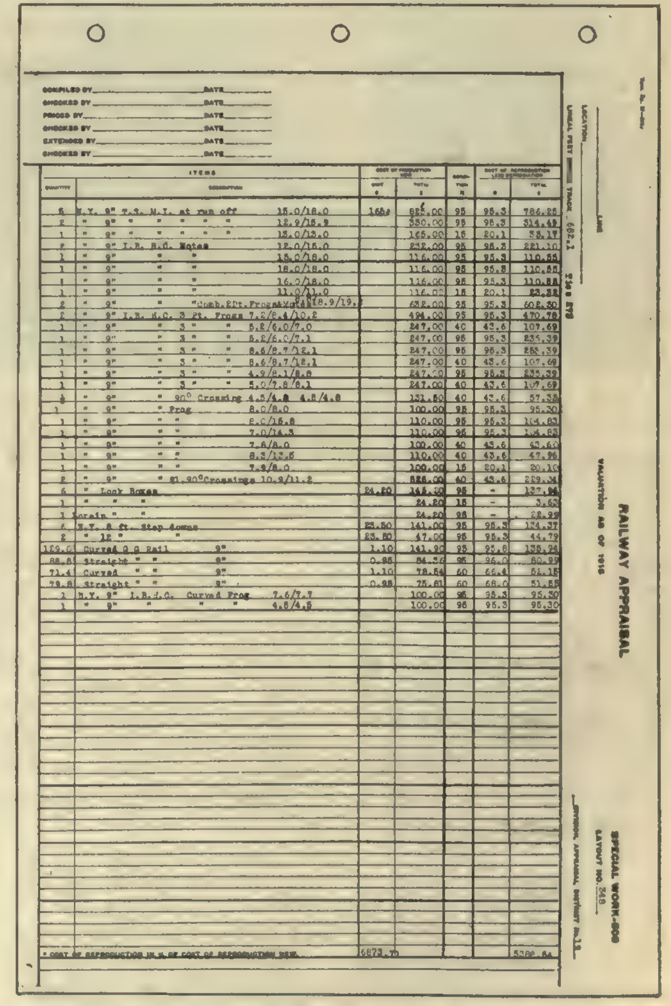
This method, which consists in treating the layout by elements, has been used in appraising properties having an aggregate of more than 2000 layouts, which is ample evidence that it has received a thorough trial. The underlying principle developed was to inventory and price the various parts or units of each layout—that is, the frogs, switches, mates, connecting rails, and spring and lock boxes. In order to prepare for the field work, sketches were made of each layout on sheets 11 in. x 17 in. Typical layouts such as branch-offs, crossings, turnouts, crossovers, and plain curves required only one sketch of each type. This was made on tracing cloth, from which could be made as many prints as desired. The layouts at carhouses and yards as well as for the large and complicated locations were sketched on thin paper by a draftsman in the field. These were later inked in without further work as soon as the sheets reached the office, after which three prints of each were made.

Triplicate prints of the sketches were required for each layout—one being used for the measurements, a second for paving measurements and notes, while the third was used for recording the notes taken by the track inspector concerning the names of the parts, manufacturer and physical condition. It is obvious that all these data could not be shown clearly and completely on the same print, and furthermore it was many times found very convenient in the office to have the data shown on separate sheets. From this it is clear that every piece of special work was actually measured and the measurements recorded on the sketch so that they can be identified at any time.

Samples of these forms, as used, are shown in the accompanying illustrations. In the one containing the diagram about one-half the sheet was used for the sketch while the remainder was used for listing and pricing the various parts. When the layout was so large that it could not be sketched on one of the regular forms a whole sheet was used for the sketch. In the case of carhouses and yards one sheet was used as a key sheet showing the general plan and how it was broken up into pieces for treatment on separate sheets. For such layouts the elements were listed and priced on a sheet expressly provided for the purpose. This is shown in the second illustration. The numbers following the description of the unit, such as 15/18, indicate the length of the unit. The quantities in the column under the star are the numbers by which the costs-new are multiplied in order to get the cost of reproduction-new less depreciation.

In this manner the scrap value was taken care of and the office work was much simplified. All of the computations were made by comptometer operators and were performed much more quickly and cheaply than by engineers or clerks.


Field Inspection by
Measured by
Computed by
Priced by
Extended by
Date Checked by Date
ITEMS
Quantity
Description
COST OF REPRODUCTION NEW
Unit $
Total $
Condition %
COST OF REPRODUCTION LESS DEPRECIATION
*
Total $
Cost of Reproduction Less Depreciation in % of Cost of Reproduction New TOTAL
LOCATION
LINEAL FEET SINGLE TRACK
DIVISION
APPRAISAL DISTRICT NO
RAILWAY APPRAISAL
SPECIAL WORK-508
LAYOUT NO


COMPILED BY______ DATE______
CHECKED BY______ DATE______
PRICED BY______ DATE______
CHECKED BY______ DATE______
EXTENDED BY______ DATE______
CHECKED BY______ DATE______

ITEMS		COST OF REPRODUCTION NEW		CONDITION	COST OF REPRODUCTION LESS DEPRECIATION	
QUANTITY	DESCRIPTION	UNIT $	TOTAL $	%	*	TOTAL $
5	N.Y. 9" T.R. M.I. at run off 15.0/18.0	165#	825.00	95	95.3	786.25
2	" 9" " " " " " 12.9/15.9		330.00	95	95.3	314.49
1	" 9" " " " " " 13.0/13.0		165.00	15	20.1	33.17
2	" 9" I.R. R.C. Mates 12.0/15.0		232.00	95	95.3	221.10
1	" 9" " " 15.0/18.0		116.00	95	95.3	110.55
1	" 9" " " 18.0/18.0		116.00	95	95.3	110.55
1	" 9" " " 16.0/18.0		116.00	95	95.3	110.55
1	" 9" " " 11.0/11.0		116.00	15	20.1	23.32
2	" 9" " "Comb.2Pt.Frogs&Mates 18.9/19.2		632.00	95	95.3	602.30
2	" 9" I.R. R.C. 3 Pt. Frogs 7.2/8.4/10.2		494.00	95	95.3	470.78
1	" 9" " 3 " " 5.2/6.0/7.0		247.00	40	43.6	107.69
1	" 9" " 3 " " 5.2/6.0/7.1		247.00	95	95.3	235.39
1	" 9" " 3 " " 8.6/8.7/12.1		247.00	95	95.3	252.39
1	" 9" " 3 " " 8.6/8.7/12.1		247.00	40	43.6	107.69
1	" 9" " 3 " " 4.9/8.1/8.8		247.00	95	95.3	235.39
1	" 9" " 3 " " 5.0/7.8/8.1		247.00	40	43.6	107.69
½	" 9" " 90° Crossing 4.5/4.8 4.8/4.8		131.50	40	43.6	57.33
1	" 9" " Frog 8.0/8.0		100.00	95	95.3	95.30
1	" 9" " " 8.0/16.8		110.00	95	95.3	104.83
1	" 9" " " 7.0/14.3		110.00	95	95.3	104.83
1	" 9" " " 7.6/8.0		100.00	40	43.6	43.60
1	" 9" " " 8.3/13.6		110.00	40	43.6	47.96
1	" 9" " " 7.9/8.0		100.00	15	20.1	20.10
2	" 9" " R1.90°Crossings 10.9/11.2		526.00	40	43.6	229.34
6	" Lock Boxes	24.20	145.20	95	-	137.94
1	" " "		24.20	15	-	3.63
1	Drain " "		24.20	95	-	22.99
6	N.Y. 8 ft. Step downs	23.50	141.00	95	95.3	134.37
2	" 12 " "	23.50	47.00	95	95.3	44.79
129.0	Curved G G Rail 9"	1.10	141.90	95	95.8	135.24
88.8	Straight " " 9"	0.95	84.36	95	96.0	80.99
71.4	Curved " " 9"	1.10	78.54	60	66.4	52.15
79.8	Straight " " 9"	0.95	75.81	60	68.0	51.55
1	N.Y. 9" I.R.&C. Curved Frog 7.6/7.7		100.00	95	95.3	95.30
1	" 9" " " " 4.5/4.5		100.00	95	95.3	95.30
* COST OF REPRODUCTION IN % OF COST OF REPRODUCTION NEW.			6873.70			5382.64

LOCATION______
LINEAL FEET ▬ TRACK 662.1
RAILWAY APPRAISAL
VALUATION AS OF 1916
SPECIAL WORK-508
LAYOUT NO. 548
DIVISION. APPRAISAL DISTRICT No.13

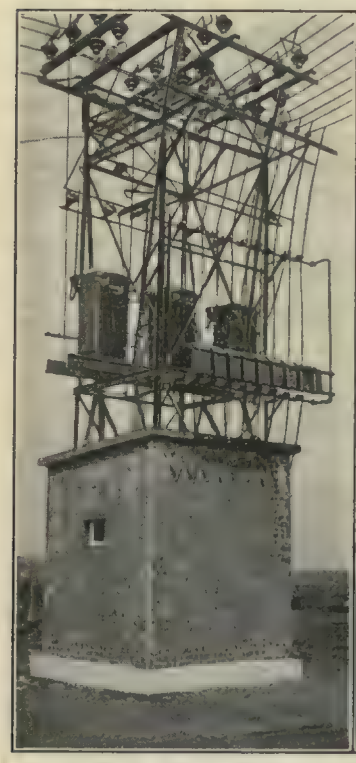
SAMPLE FORM USED IN RECORDING SPECIAL WORK DATA LIST AND PRICE SHEET USED IN RECORDING DATA OF ELABORATE LAYOUTS

Railway Practices in Supplying Commercial Energy

Character of Load Connected and Construction Details of the Des Moines Inter-Urban Railway Commercial Substations Are Described

BY F. C. CHAMBERS
Electrical Engineer Inter-Urban Railway, Des Moines, Ia.

It is the policy of the Inter-Urban Railway to establish a commercial light and power business in conjunction with the operation of its 74-mile railway system. At present the commercial business is represented by approximately 4 per cent of the total output of the generating station of the Des Moines City Railway, from which the Inter-Urban buys its power, or approximately 14 per cent of the total power used by the Inter-Urban Company. Development of this business covers a period of approximately three years, and it is safe to say that the business will more than double in the next three.



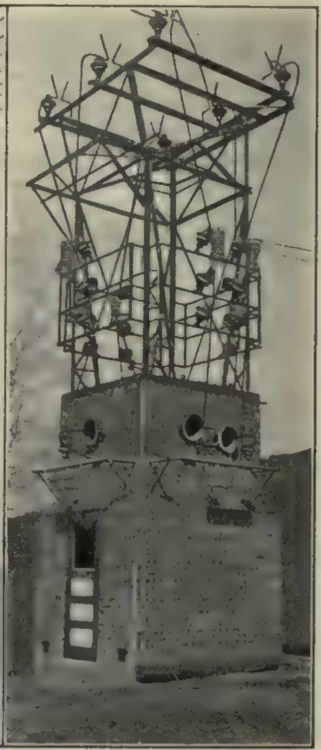


FIG. 1—TYPICAL OUTDOOR-TYPE SUBSTATION SERVING SMALL TOWNS ALONG RAILWAY ROUTE. FIG. 2—SPECIAL TOWER FOR INTER-CONNECTING FORT DODGE AND INTER-URBAN POWER SYSTEMS

In so far as possible the lighting business is a wholesale one, the retail lighting representing but a small portion of the total. The power business, on the other hand, is thus far sold on a retail basis. To date, light and power are being furnished to six small towns either on the right-of-way or a short distance from it. The power business is confined at present to supplying several coal mines, a gravel pit and washer, and a large canning factory, each of which requires from 6000 to 25,000 kw.-hr. per month.

Three of the towns located on the line are supplied from outdoor substations with three-phase, 440-volt, 25-cycle energy. Three towns which are some distance from the right-of-way are supplied from similar stations with 4400-volt, three-phase current. In these cases an auxiliary 4400-volt line, owned and maintained by the consumer, carries the energy from the station on the right-of-way to the town supplied. The coal mines and gravel pit are supplied from branches of the 22,000-volt transmission line paralleling the track, with substations in these cases located immediately adjacent to the mine or pit.

One of the substations in use is shown in Fig. 1. The tower is built of galvanized-steel angles and channels and iron pipe. The equipment was furnished entirely by the Delta-Star Electric Company, and was shipped knocked down to the point where it was to be erected. The high-tension entrance to the tower is at the top, through an air-break switch which is operated by a lever at a point approximately halfway between the base and the top of the tower. Lightning protection is provided through an ordinary horn gap and choke coil, the steelwork being solidly and permanently grounded. The tower is provided with three mast arms to facilitate the removal of transformers for repairs, etc. The steelwork at the base is set in concrete 4 ft. deep. This concrete provides a foundation as well as a floor for the small brick building at the base, which is built up of a single tier of red paving brick laid in cement mortar and plastered on the inside.

The roof is a 4-in. reinforced concrete slab. A clear wire-glass panel in the door and small frosted wire-glass windows provide plenty of light for the interior. Ventilation is secured through iron gratings in the front wall and cast-iron ventilator caps in the roof at the opposite side. This structure houses the metering and distribution panels and the necessary instrument transformers. The main panel supports an inverse time-limit overload relay, a three-phase Thomson watt-hour meter, and an oil-break switch. On the distribution panel are mounted three 100-amp., double-pole, single-throw knife switches for lighting service and one three-pole, single-throw knife switch for three-phase power distribution.

SUBSTATION CONSTRUCTION COST (FIG. 1)

One steel tower, f.o.b. cars Des Moines	$400.00
Loading and hauling material	18.76
Foundation, labor and material	71.88
Erecting tower, labor	84.29
Connecting and cutting in	7.31
Finishing	42.98
Setting transformers	41.92
Brick structure, material and labor	150.00
Metering equipments, etc., installed	150.00
Transformers, three, 20 kva	500.00
Total	$1,467.14

The above arrangement is characteristic of all the commercial substations along the line, except that in some cases the feeder panels are omitted. The load in these small towns usually includes a few small motors, but is lighting for the most part. In some cases a motor is used to pump the town's water supply, and there is usually a grain elevator requiring from 5 to 15 hp. The normal consumption at these places is from 1000 to 3000 kw.-hr. per month.

One of the coal mines having a lift of 335 ft. is equipped with a 225-hp. maximum, intermittent-duty, variable-speed hoisting motor, a 25-50-hp., two-speed fan motor, and several smaller pump motors. Electric locomotives for haulage and mining machinery are being installed. The capacity of the mine is 125 tons per hour, but it is operating at present at one-third capacity, with a consumption of between 10,000 and 12,000 kw.-hr. per month. Operating at full capacity, the load at this point will be more than trebled.

A gravel pit operating eight months per year at a capacity of forty cars of washed gravel per day with a power consumption of 25,000 kw.-hr. per month is undergoing changes which in the next year will increase its output by one-third with a proportional increase in power consumption. This industry is reached by a spur from the main line of the Inter-Urban and thus affords valuable freight business.

The power consumption at the canning factory varies from 3000 to 15,000 kw.-hr. per month according to the season.

That the enterprise of supplying commercial energy is a growing one is evidenced by the fact that the commercial output has increased from 2800 kw.-hr. in May, 1914, to 73,200 in September, 1916.

Fig. 2 shows a standard tower arranged to accommodate a 22,000-volt sectionalizing switch and metering and remote-control equipment. Through this station, power is either supplied to or taken from the transmission line of the Fort Dodge, Des Moines & Southern Railroad. The oil switch is operated by a solenoid remotely controlled from a substation 3 miles distant, power being supplied to the closing coil direct from the 600-volt trolley wire. It will be noted that the arrangement of this tower has been changed to accommodate both an incoming and outgoing line of high potential by eliminating the air-break switch at the top of the tower. Entrance is made to the building through choke coils and disconnecting switches mounted on insulators secured to pipe frame work, and thence through plate glass disks cemented into the 12-in. sewer pipe bell built into the walls. Lightning protection is afforded by the installation of horn gaps at the top of the tower.

The rate made to the small towns is based on a fixed charge plus a flat energy charge. Rates made to the industries are based on a demand charge plus a flat energy charge.

Home-Made Trolley Wheels on Key Route System

Owing in large measure to its distance from the Eastern markets, the San Francisco-Oakland Terminal Railways does much brass foundry work. This includes the manufacture of 5½-in. diameter trolley wheels. These wheels are made up as follows: Copper, eighty-eight parts; tin, ten parts; zinc, two parts. To a 200-lb. bath of new metal, it is customary to add 100 old trolley wheels which average about 2¾ lb. each when discarded.

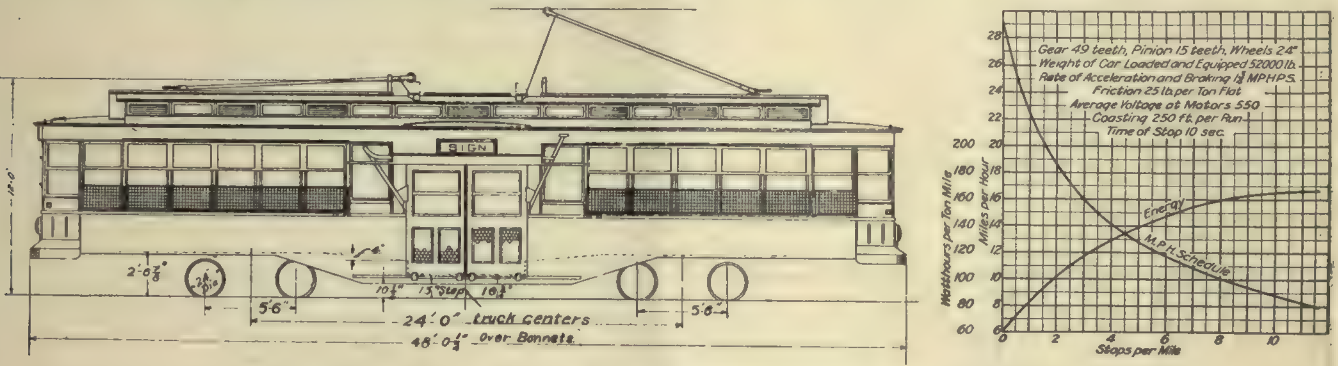
The formula mentioned was originally that of the company's bushings. As these bushings outwore the wheels, it was decided to try the same composition for the entire wheel. The average life of wheels, with a base tension of 18 lb. to 19 lb., is 9000 miles. One early wheel on exhibit in the office of George St. Pierre, superintendent of equipment, made 9411 miles before being scrapped.

Low-Floor Multiple-Unit Cars for Boston

One hundred center-door motor cars are soon to be placed in service by the Boston Elevated Railway, and the designers have incorporated in the construction a number of interesting features, aside from the use of 24-in. wheels whose value has been demonstrated in Boston through their use with the trail cars purchased about one year ago for use in rush-hour service on several lines where operating conditions made this desirable.

For the car body the most prominent feature appears in the unusual arrangement of trolley poles, which reflects the experience obtained with the company's articulated cars. Contrary to the general custom, the active trolley pole serves the front end instead of the rear end of the car, the base being located ahead of the truck and the pole extending backward toward the center of the car. Thus control of the pole is placed conveniently in the hands of the conductor stationed in the central well, since the trolley rope is extended down through a hatch in the roof and is made fast inside of the car.

No doors are provided other than those at the center, and these are 6 ft. 6 in. wide. The sliding panels are pneumatically operated and are controlled through a valve which in turn is moved as desired by the conductor through a system of levers. The entrance step at the threshold is 15 in. high, and the center well is ramped toward the center to give a rise of 1¾ in. The step at either side of the entrance well is 10 in. high and there is a 4-in. ramp leading up to the main floor level, which is 30⅞ in. above the rail.



LOW-FLOOR CAR FOR BOSTON ELEVATED RAILWAY; SPEED-ENERGY DIAGRAM

High schedule speed is expected from the equipment, and in consequence four GE-247 motors, rating 40 hp. at 600 volts, have been installed, this type of motor weighing 1730 lb. complete with gear cover and gear. The service for which the car is designed includes an average number of stops per mile approximating five and one-half, with an average duration of stop of ten seconds, but it is expected that a schedule speed of 11.5 m.p.h. will be maintained, including layover time. The runs in question, it may be said, include about 3½ miles of operation in tunnel and about 5 miles of operation on the surface for each round trip. One of the accompanying illustrations shows the theoretical possibilities in the way of schedule speeds that are the result of this propulsion equipment.

To carry out the plan of rapid car movement, automatic starting signals and automatic coupling of cars for train operation have been provided. The control is automatic, and by the use of the PC-5 control equipment, in which the contactors are mechanically operated by cams on a shaft, a definite frequency in contactor operation is insured and the complications of interlocking for automatic control have been avoided.

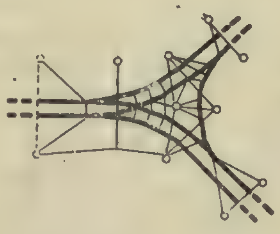
Cost of Erecting Overhead Work—VIII

(From the records of a large Eastern company)

The following is the eighth group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; March 31, page 606; and April 14, page 702. The remaining groups of this series will be published in later issues of this paper.

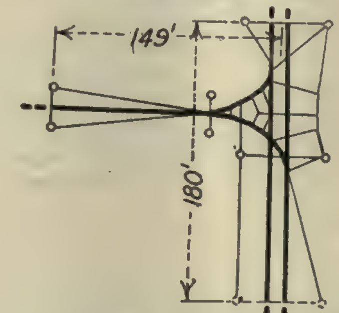
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track "Y" with single track connecting curve, angle 90 deg.



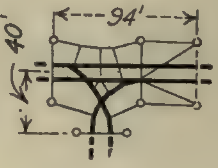
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
54*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Single track right-hand branch-off and single track left-hand branch-off, crossing single track and forming single track "Y" into single track branch line, angle 90 deg.



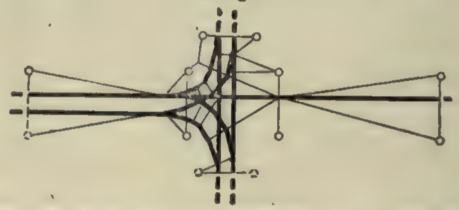
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
55*	$45.38	$33.00	$54.45	$39.60	$63.53	$46.20

Single track right-hand branch-off crossing single track and single track left-hand branch-off crossing right hand into double branch line, angle 90 deg.



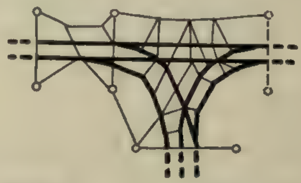
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
56	$31.90	$13.20	$39.88	$16.50	$47.85	$19.80

Double track three-part "Y" with single track through connection, angle 90 deg.



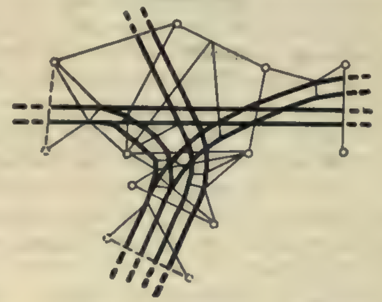
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
57*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Double track three-part "Y", angle 90 deg.



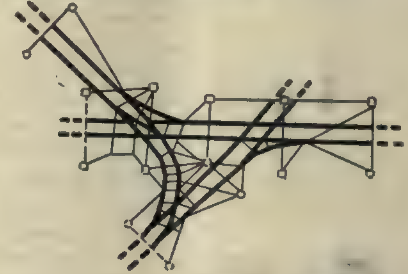
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
58*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Special double track, three-part "Y" crossing a double track



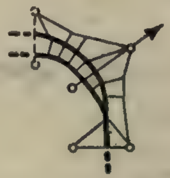
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
59*	$72.60	$52.80	$90.75	$66.00	$108.90	$79.20

Special double track three-part "Y" branch-off crossing double track combined with double track crossing with single track connecting curve.



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
60*	$72.60	$52.80	$90.75	$66.00	$108.90	$79.20

Single track plain curve with single track left-hand branch-off, angle 90 deg.



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
61	$23.93	$9.90	$31.90	$13.20	$39.88	$16.50

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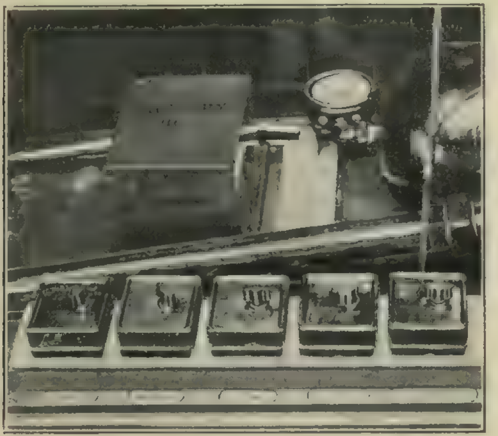
*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Marking Car Switches to Distinguish Circuits

BY C. L. KELLER
Assistant Master Mechanic Detroit United Railway

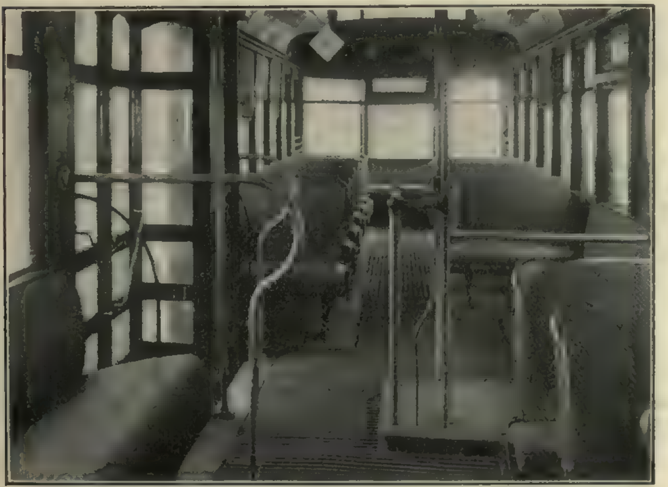
Owing to the fact that the General Electric snap switches controlling the lighting, signal, air compressor, etc., circuits installed in our cars are of the same type and identical in appearance, we have found it advantageous to designate what each switch controlled. Trainmen have frequently turned off the signal switch at the same time they turned off the lights, and then because the signal between trailer and motor car would not operate, would turn the car in for defective signals. This has been eliminated by making a small nameplate which is tacked just below each switch. These are the same as are used in marking our foundry patterns so that the number will stand out on the casting, and the same stencil press is used so that very little expense is added. These stencils have been installed on all cars and have been appreciated by the trainmen.



STENCIL MARKING OF CAR SWITCHES

Railings Aid Prepayment Fare Collection in Des Moines Car

The railings shown in the accompanying illustration were installed in the Des Moines (Iowa) City Railway low-floor cars after experience had demonstrated that the wire mesh guards at the end of the seat and adjacent to the door well were not sufficient during rush hours to prevent passengers from reaching their seats without paying their fares. It being found that while one passenger would be paying a fare and the conductor making change, another passenger would edge around behind the one paying and get past the conductor. The railing on the entering side extends far enough into the center of the car to prevent passengers from getting by the conductor without being noticed. The railing on the exit side of the door well was installed to give passengers a hand hold while waiting to get off, since there was some danger of their being pinched or bruised by the door if they took hold of the wire guard.



RAILING INSTALLED TO PREVENT LOSS OF FARES

Portable Automatic Substation for Kansas City Railways

Simplified Diagram of Connections Is Shown by Which the Different Steps in the Operation Can Be Readily Followed

The Kansas City (Mo.) Railways has purchased a portable automatic substation which will be delivered in July. In describing the operation of this substation, the railways' company publication uses the diagrams shown herewith which are simplified to such an extent that the different steps in the operation can be followed without any difficulty.

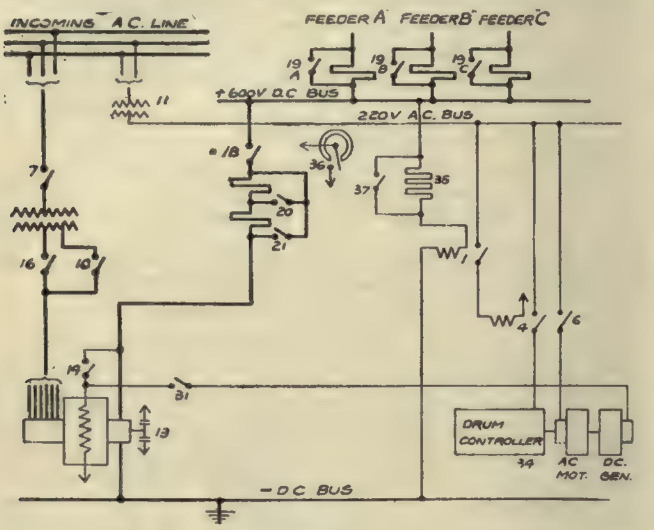
When the potential on the d.c. bus falls below a predetermined amount, 450 or 500 volts, a contact-making voltmeter closes switches 1, 4 and 6. This starts the motor-driven drum controller which in turn actuates the operating switches of the substation. The first controller position closes the oil switch 7, on the incoming a.c. supply. The second position closes switch 10, which places the converter on the starting taps of the transformers. After synchronous speed has been reached the momentary closing of switch 31 places the field of the converter across the terminals of the d.c. exciter long enough to fix the correct polarity. The fifth controller position closes the field break-up switch 14, placing the shunt field of the converter directly across its armature, and 16 is also closed, putting full a.c. voltage on the converter. Switch 18 is next closed. This connects the positive terminal of the converter with the positive d.c. bus through two sets of resistances, which are notched out by the next two positions of the controller. The ninth and final controller position opens switch 6, which stops the controller driving motor.

Sequence	Device Number 1	4	6	7	10	13	14	16	18	A 19	B 19	C 19	20	21	31	36	37	Remarks
1-Shut Down										○	○	○					○	Controller Off
2-Low D.C. Voltage	○	○	○							○	○	○					○	Controller Starts
3-1st Controller Position	○	○	○	○						○	○	○					○	Oil Switch Closes
4-2nd Controller Position	○	○	○	○	○					○	○	○					○	Starting Tap
5-3rd Controller Position	○	○	○	○	○	○				○	○	○					○	Sychronous Speed
6-4th Controller Position	○	○	○	○	○	○				○	○	○			○	○	○	Polarity Fixed
7-5th Controller Position	○	○	○	○		○	○	○		○	○	○				○	○	Full Volts-Self Excited
8-6th Controller Position	○	○	○	○		○	○	○	○	○	○	○				○		All Resistance In
9-7th Controller Position	○	○	○	○		○	○	○	○	○	○	○	○			○		Part Resistance Out
10-8th Controller Position	○	○	○	○		○	○	○	○	○	○	○	○	○		○		All Resistance Out
11-9th Controller Position	○	○		○		○	○	○	○	○	○	○	○	○		○		Controller Stops Run
12-Light Overload Feeder "A"	○	○		○		○	○	○	○		○	○	○	○		○		19 B or 19 C Open On
13-Medium Overload Feeder "A"	○	○		○		○	○	○	○		○	○	○			○		Feeders B or C
14-Heavy Overload Feeder "A"	○	○		○		○	○	○	○		○	○				○		Correspondingly
15-Underload			○	○		○				○	○	○				○	○	Controller Starts
16-Shut Down										○	○	○					○	Controller Stops Off

DIAGRAM SHOWING SIMPLIFIED CONNECTION OF POWER AND CONTROL APPARATUS OF AUTOMATIC SUBSTATION

Instead of using circuit breakers to protect the d.c. feeders, resistances *A*, *B* and *C* are provided. The resistance short-circuiting switches, 19*A*, 19*B* and 19*C*, will operate on light overloads, medium overloads will open switch 21, which inserts an additional resistance, and on heavy overloads switch 20 will also be opened.

When the d.c. line voltage rises so that the current supplied by the substation falls below a predetermined minimum, switch 37 closes and through relays not shown in the diagram, and switch 6, starts the driving motor of the controller. The latter then revolves to its original position, at the same time opening the necessary switches for shutting down the station.



POSITIONS OF DRUM CONTROLLER FOR OPERATING AUTOMATIC SUBSTATION

These are in brief the operations of starting and stopping the automatic substation. There are additional relays for protection against short-circuits in the station, and thermostats are located in the bearings and windings of the converter so that if any overheating occurs relays will operate to shut down the station.

Cupping of Rails at Junctions with Special Work

An engineer connected with the way department of one of the large electric railway companies reports certain experience with the cupping of open-hearth rails at their junctions with the hard centers in special work. This company was having considerable trouble with the breaking of rail ends abutting hard centers in crossing frogs, and the gouging out of the rail heads on curved special work. This was attributed to the difference in wearing qualities of the manganese centers and the open-hearth steel in the rail. In several special work layouts heat-treated Mayari steel was specified for the centers, and these layouts have now been in successful use for two years or more.

In one case Mayari steel centers were specified in the four frogs of the single-track curved crossing formed by the outer curves of a double-track wye. The rails in the former crossing, which had the harder centers, had been gouged out after two and one-half years' service to such an extent as to make renewal imperative. After two years with the softer centers no gouging is evident and the centers are still in good condition, the maintenance expense being zero to date.

The explanation of this phenomenon of gouging is probably that as the abutting rail wears away faster than the hard center, there is a tendency for wheels to jump from the center to the rail, making a depression. Having been started such a condition tends to become worse as the wear increases.

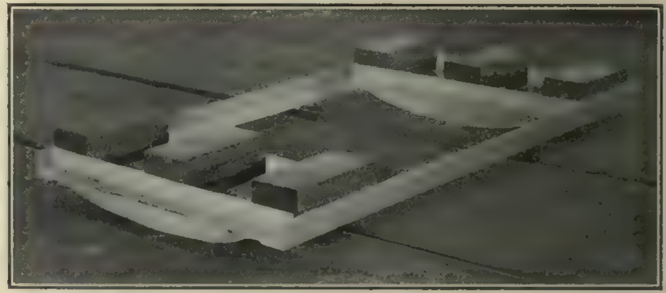
On this railway the same type of center was specified in a double-track 90-deg. crossing which was installed in the fall of 1914. Here the rail abutting on the centers does not as yet show any of the signs of pounding which, according to the company's engineers, is often found to occur with hard steel centers. Mayari steel was also specified in frogs of a double-track branch-off constructed in the fall of 1914 and this also shows very uniform wear.

Substitute Tie for Heavy Service

At the recent convention of the American Railway Engineering Association attention was called to the numerous attempts that have been made to produce a suitable substitute for wooden ties in steam railroad track. Many of these have proved unsatisfactory, apparently because of the difficulty of getting sufficient flexibility of track when the ties are composed altogether of steel and concrete.

To meet this difficulty the International Steel Tie Company, Cleveland, Ohio, has recently brought out a new form of substitute tie in which only a small amount of wood is used to give flexibility, and the requirement of timber is but a fraction of that obtaining when standard wooden ties are used. Thus there is offered an opportunity to relieve the excessive drain upon the timber resources of the United States that has been so much in evidence within past years. The tie is a modification of the well-known twin-steel tie, being built up of angles and warped plates ⅜ in. in thickness, with creosoted wooden blocks to receive the rail. The plates are warped in from the two sides, which gives them vertical strength and forms a tamping pocket in the ballast underneath. Two angles spaced 12 in. back to back are riveted to each plate to form a pocket for receiving three 6-in. x 8-in. x 12-in. creosoted oak blocks. The rail is fastened to these blocks with cut spikes.

This combination of material forms a rugged tie that is perfectly insulated for track circuits. Long life of track is insured by the thickness of the steel composing the tie, and when the wooden blocks fail mechanically renewal is simple. This tie replaces two wooden ties and furnishes 8 sq. ft. of bearing area on the ballast.



COMPOSITE SUBSTITUTE TIE FOR USE IN OPEN TRACK OR IN LOCATIONS WHERE INSULATION IS DESIRED

Various modifications of the design are furnished, including one to provide different lengths for the wooden blocks for supporting a third-rail insulator. Its special advantages are opportunity for use in street crossings where insulation between the rails is desired on account of the existence of signal circuits. It serves also as a substitute tie in open track, being installed under these circumstances with ballast tamped underneath just as if the track were supported in the customary manner. The tie, however, may be used in paved streets with a concrete base to give the rigidity that is necessary under these conditions to avoid destruction of the pavement by the working of the rails.

London Letter

Problem of Male Help More Pressing—Results of Shildon and Newport Electrification—Another Bakerloo Extension Opened

(From Our Regular Correspondent)

There are various indications that tramway managers are about to have further strains put upon them in the very near future in regard to employees. The list of certified occupations of Nov. 20, 1916, has been revised with a view to releasing more men for the army. The principal alteration in the new list is that the age limit for married men has been raised from twenty-five years to twenty-seven years. Men under the age limits who are classed in category B (1), *i.e.*, for garrison duty abroad, are no longer entitled to be treated as in a certified occupation, as they were in previous lists, and a further list is promised shortly in which the reservations will be reduced by a further raising of the age limits, and doubtless a further lowering of the categories. A significant sign of the times is the decision of the home office to authorize the London commissioner of police to license qualified women to be drivers of public vehicles, including tramcars. Reports are being received that women are giving satisfaction in spite of unfavorable climatic and dense traffic conditions. It is also alleged that no difficulties have been experienced at gradients nor has the operation of brakes had unfavorable results where women have been used as drivers. This testimony, as well as the action of the Metropolitan police, will necessarily influence the authorities, and managers may be faced with the alternative of curtailment of services or employment of women drivers.

The results of the Shildon and Newport electrification seem to have satisfied the board of the North Eastern Railway. The board financed this work out of revenue, in order to be on the safe side, but the experience of more than a year's operation has justified the placing of £100,000 of the expenditure to capital account, so the chairman informed the recent general meeting of the stockholders of the North Eastern Railway. Whence it may be reckoned that it promises to result in a revenue benefit of perhaps £6,000 to £8,000 per annum. The importance of the case is that it is the first instance in this country of the electrification of a line carrying goods and minerals on a large scale.

The Liverpool Overhead Railway, which was rather hard hit by tramway competition, had a record traffic for the year 1916. It was no less than 26 per cent better than in 1913, and is still growing.

The suggestion made a little time ago of the desirability of linking up Keighley with Bingley and the Bradford tramway system, inspired in all probability by the greater use now being made by the public of the tramway services, is still under consideration. Recently a friendly and informal conference of representatives of the Keighley Town Council and the Bingley District Council was held on the subject, and the matter will be talked over with the Keighley Rural District Council, in whose area the linking-up line would have to be made. At present the Keighley tramway system stops a little short of the bridge over the Aire at Stockbridge, and the bridge itself will have to be altered if a tramway is to cross it. The Bingley system also ends a short distance from the boundary at Morton Lane. Between is a gap of 2 miles. The completion of the Bingley line past Ryshworth Hall is held up until after the war.

At a meeting of the Chester Town Council it was decided, because of the shortage of labor and the urgent necessity of repairs, to stop the Sunday tramway service for the present. It was also agreed that the fares should be increased to a basis of 1*d.* a mile, but the 0.5*d.* fare for school children was retained.

The report of the Bristol Tramways & Carriage Company for 1916 states that the gross receipts amounted to £555,907, and the working and general expenses and renewals to £450,447, leaving, with the balance brought forward, a net revenue of £110,515. Of this, interest and dividends absorbed £57,754, and it is now proposed to pay a final dividend on ordinary shares at the rate of 7 per cent per annum, subject to tax, making 6 per cent for the year, and to add to reserve for contingencies and renewals £30,000, leaving £9,635 to be carried forward.

At a meeting of the London County Council it was recommended that the question of expediting the repayment of the debt in respect of obsolete capital expenditure outstanding on the horse tramways be postponed for a further three years, unless any surplus be available earlier for the purpose after the reserve fund has been made up to the full amount necessary on the basis agreed to. The highways committee was reported to be of the opinion that in the present circumstances no useful purpose would be served in attempting to settle the basis of the provision to be made for renewals.

The report of the electric supply committee of the Birmingham City Council includes the detailed report made by Councilors Appleby and Beale on their inquiry into the causes of the recent interruptions of electric supply, which led to frequent stoppages of the tramway services of the city. They find that the failures were due primarily to an abnormal demand for current following the outbreak of war, which was greater than the committee could reasonably be expected to have foreseen. The increased demand came at a time when the department was least able to meet it, and the inability to meet the exceptional situation arose from causes which were not beyond the control of the committee. Following this report is a statement upon it by those members of the committee who have been members since November, 1911, and a statement by the city electrical engineer, who, Messrs. Appleby and Beale state, cannot be absolved from criticism in reference to certain delays. The report, the committee adds, concludes with an expression of grave apprehension as to the immediate future. The demand for current, however, is now being overtaken, but the spare plant is admittedly meager and new connections are constantly demanded. The committee is of the opinion that even now the permanent station should be proceeded with. Plans are in preparation, and in order to allay any anxiety that may be aroused by the observations contained in the report upon the disadvantages of the Nechells permanent site, the committee has asked C. P. Sparks, the president of the Institution of Electrical Engineers, to furnish it with a report.

Sir Albert Stanley, the president of the Board of Trade, has appointed a committee to consider and report on what steps should be taken, whether by legislation or otherwise, to insure that there shall be an adequate and economical supply of electric power for all classes of consumers in the United Kingdom, particularly industries which depend upon a cheap supply of power for their development. The committee is constituted as follows: The Right Hon. F. Huth-Jackson (chairman), H. Booth, James Devonshire, G. H. Hume, John Kemp, H. H. Law, M. I. C. E.; C. H. Merz, Sir Charles Parsons, K. C. B.; Sir John Snell, M. I. C. E.; Alderman C. F. Spencer and A. J. Walker, K. C.

The extension of the Bakerloo Railway from Willesden Junction to Watford has now been opened. This is the sixth extension of the railway since its inception in March, 1906. After coming to the surface at Queen's Park, the Bakerloo trains will run over the electric line of the London & North-Western system to Watford, via Willesden Junction New Station. The extension has increased the length of the Bakerloo run to more than 20 miles, and has added twelve stations to the line of route. It opens up a large area of new residential districts, and connects the northern suburbs with the central, west-end and south-eastern districts of London. In addition, it will give passengers using the London & North-Western system a choice of new terminal stations in London, connecting with main line railways, for the new line joins up Paddington (Great Western Railway), Marylebone (Great Central Railway) and Waterloo (London & South-Western Railway), with Willesden Junction and Watford. Other main-line railways can easily be reached by Bakerloo passengers. By changing at Oxford Circus they can travel to Liverpool Street (Great Eastern Railway); a change at Piccadilly Circus enables them to get to King's Cross (Great Northern Railway), and the Trafalgar Square station is only a minute's walk from Charing Cross (South Eastern & Chatham Railway).

A. C. S.

News of Electric Railways

Traffic and Transportation
Financial and Corporate
Personal Mention
Construction News

Decision in Tacoma Case

State Commission Refuses to Assume Power to Abrogate Franchise Provisions Considered Unreasonable by Tacoma Railway & Power Company

The State Public Service Commission at Olympia, Wash., on April 27, dismissed the case of the Tacoma Railway & Power Company against the city of Tacoma and refused to assume power or authority to abrogate franchise provisions or relieve a public utility of franchise obligations which have become burdensome, even though it may appear that compliance with those provisions will impair the capital of the company. The decision assures the city of Tacoma $22,000 a year in gross earnings tax, about $4,500 a year in street railway fares for city employees, and the cost of maintenance of paving between tracks and 1 ft. on each side, amounting to about $20,000 a year. The decision of the commission was unanimous in holding the State Board has no power to interfere and grant relief, but each of the three commissioners wrote a separate opinion giving his views on the subject.

COMPLAINT FILED LAST OCTOBER

The complaint of the Tacoma Railway & Power Company was filed last October. In its prayer the company declared that its revenues were insufficient for it to comply with any of the provisions of the city franchise, except to render adequate and efficient service at a fair and reasonable rate. It asked to be relieved of paying its gross earnings obligations and for the maintenance of streets and bridges, and expressed a desire to be relieved of carrying city employees without charge. The company contended that through the "gratis franchise rights" to the jitney bus, the net earnings of the company had been reduced to a point where they were sufficient to do no more than to pay the interest on its indebtedness.

Counsel for the cities of Seattle, Spokane, Everett and Bellingham joined with City Attorney U. E. Harmon of Tacoma in writing the city's brief and in arguing the case before the Public Service Commission. Hugh M. Caldwell, corporation counsel of Seattle, and Walter F. Meier, assistant corporation counsel of Seattle, were among those entered as counsel. When the case was heard orally on Jan. 15, arguments were made by City Attorney Harmon of Tacoma and Mr. Meier. The case was taken under advisement at that time. In a previous case brought by the Puget Sound Electric Company, Seattle, similar release was sought, and in that case the commission held that it had jurisdiction, although there was an understanding that the question of jurisdiction might subsequently be raised.

MATTER IN QUESTION A JUDICIAL ONE

The decision, quoted as follows, covers the questions raised by the city attorney:

"The terms and conditions relating to paving and the bridge expense do not partake of the character of rate or service regulation, but on the contrary relate to adjustment of street paving and bridge construction and maintenance burdens. Whether or not the adjustment of street paving and bridge construction and maintenance burdens is a proper subject to be included in terms and conditions prescribed for the location and construction of a street railway, is a question for the courts to determine without previous action by the commission, for it is purely a judicial one.

"The terms and conditions relating to the gross earnings tax do not partake of the character of rate or service regulation, although such a tax may affect the rate or the ability of the company to render proper service in the same manner that any other tax affects the rate or the ability of the company to render proper service. Whether the Legislature intended to delegate to the city power to levy a gross receipts tax when prescribing terms and conditions for the location and construction of a street railway, is also a judicial question for the courts to determine without action by the commission."

Commissioner Spinning held that the Public Service Commission's jurisdiction over street railways was closely to rate and service regulations, leaving franchise requirements as to paving, bridge construction costs and payment of earnings tax by the company to be determined in court without previous action by the commission. He held that the Legislature did not give the commission the power to grant franchises or prescribe terms and conditions upon which street railways should be operated and constructed, but conferred that power on cities. Such power, if judicially upheld, was authority of equal dignity with the power of the commission regarding tracks and service. Hence, when the city had acted within the scope of its franchise-granting power, it was not for the commission to determine whether the city had exercised its power wisely or unwisely.

Commissioner Lewis concurred in the dismissal on the ground that street railways were limited by law to charge 5 cents. He held that the commission was without power to eliminate any item of operating expense or maintenance of fixed charges of street railways.

Chairman Blaine, in his opinion, said:

"Under the public service act of this State any city or town may become a complainant and at its own instance the commission can proceed against a public service body, but to reverse this order and allow a utility to complain against a municipality would be a procedure which the statute does not seem to contemplate."

SIMILAR PRINCIPLES INVOLVED ELSEWHERE

The decision is regarded as extremely important by other cities, as similar principles are involved in the litigation between the city of Seattle and the company there. The Seattle petition was filed with the commission about two years ago, but it has been held in abeyance awaiting the completion by the commission of a physical valuation of the street railway properties there.

According to a statement of officials of the Puget Sound Traction, Light & Power Company, an appeal will be taken to the Thurston County Superior Court from the decision of the commission.

Following the commission's decision, Commissioner of Public Works Atkins of Tacoma immediately sent a letter to City Attorney U. E. Harmon, asking that he give formal notice to the company to repair the pavement between its tracks. According to Commissioner Atkins, the condition of the streets named presents a continual menace to life.

New York Legislature Adjourns

The New York Legislature adjourned on May 10. It seems likely, however, that a special session will be called to deal with the economic problems growing out of the war. The outstanding features of the session to the electric railways were the defeat of the Thompson bill to reorganize and consolidate the Public Service Commissions and the passage over the veto of Mayor Mitchel of the Ottinger bill giving the Public Service Commission for the First District of New York jurisdiction with the Board of Estimate of New York in relation to the pending contract between the city of New York and the New York Central Railroad for the proposed West Side improvement.

South Bend Men Still Out

Agreements Reached with Interurban Men and Employees in Elkhart and Michigan City, but South Bend Men Refuse Company's Offer

Following the mass meetings of labor unions at South Bend, Ind., to create public sympathy for the strike of the local men of the Chicago, South Bend & Northern Indiana Railway, which was called on April 29, as reported in the May 5 issue of this paper, page 839, strike sympathizers began rioting in the business district of the city about noon on May 2, compelling the company to withdraw all the cars which it was operating. No protection was afforded by the police of the city, and an appeal was made by General Manager F. I. Hardy to Mayor Keller for more adequate protection.

2 CENTS ADDITIONAL TO ELKHART, MICHIGAN CITY AND INTERURBAN MEN

On May 2 Mr. Hardy, in conference with a committee of the trainmen of the interurban lines who had not joined in the strike, effected a settlement of their differences, under which the men were granted an increase in wages of 2 cents an hour, the new scale ranging from 25 to 34 cents an hour for conductors, and 26 to 35 cents an hour for motormen. The demands of employees of the local lines of the company in Elkhart and Michigan City were also adjusted by a compromise between the company and the employees. These men were also granted an increase of 2 cents an hour.

On May 4 an offer of an increase of 2 cents an hour in wages was made to the striking employees at South Bend, but was refused by the men on account of provisions stipulating that the new agreement should be executed by the men as individual employees by 6 p. m. on May 5, and the refusal of the company to deal with the union. Rioting in the city grew worse on May 4, with the attitude of the police tending to aid rather than deter the acts of depredation. Eighteen arrests were made of persons stoning the crews of cars being operated. Mayor Keller issued a proclamation calling on citizens to refrain from gathering on the streets, and warning them to keep moving.

An appeal by the union to the Public Service Commission to act as a board of arbitration as in the case of the Indianapolis strike of 1913 was declined by the commission on account of the law passed by the Indiana Legislature in 1915 providing for an arbitration board to be appointed by the Governor in case of labor disputes and strikes.

After conferring with Governor Goodrich, Sheriff Bailey, of South Bend, assumed control of the situation at South Bend on May 5, and appointed fifty deputies to aid the police.

MEN APPEAL TO GOVERNOR

Governor Goodrich stated that he had received a telegraphic appeal from Claude F. Barnes and Edward Carr, South Bend, whom he inferred were officers of the local union, asking him to appoint an arbitration board under the act of 1915 to investigate and adjust the strike at South Bend. The Governor stated that he had decided to appoint such a board, but that he would not be ready to announce the names of the arbiters until he had been afforded an opportunity of selecting men desirable for such a service.

Mr. Hardy stated on Saturday night, May 5, that he was satisfied with conditions and that through the co-operation of Sheriff Bailey and his deputies full service on the South Bend city lines would be restored by Monday. He added that the striking motormen and conductors might consider themselves as discharged.

The strikers held their second mass meeting on Saturday night, May 5, but no trouble resulted. No arrests were made during the day, but seven persons were arrested at night on charges of throwing stones, inciting riot, etc.

On May 7, Governor Goodrich telegraphed to the officials of the railway and to representatives of the striking trainmen that he intended to appoint arbitrators at the earliest moment possible, and asked that some arrangement be made if possible to resume work pending the appointing of the arbitration board and its investigation of the difficulties —with the understanding that the settlement reached should date back to the appointment of the board.

$46,862,972 Fixed as Portland Value

Public Service Commission Makes Ruling on Portland Railway, Light & Power Company, Portland, Ore.—Rate-Making Basis Set

The Public Service Commission of Oregon on April 30 handed down its valuation order as to the railway, electric utility and gas utility divisions of the Portland Railway, Light & Power Company, determining the value of the company's properties for rate-making purposes at $46,862,971. This valuation is approximately $14,000,000 less than the valuation found by the company's engineers. A set of preliminary findings was issued by the commission about a year ago. The total value of the properties is placed at $55,307,474, as of Dec. 31, 1916. Of this amount the commission finds that $8,444,502 represents non-utility property, leaving a total valuation of the property used and useful to the service of the public of $46,862,971. The apportionment of this value is as follows:

Railway divisions—	
Portland Railway	$18,233,372
Oregon Water Power & Railway	7,402,195
Mount Hood Power & Railway	1,523,454
Total railway	$27,159,021
Electric utility divisions—	
Portland	$17,689,980
Willamette Valley	1,177,005
Vancouver	625,168
Total electric utility	$19,492,153
Salem gas utility	211,798
Total utility property	$46,862,971

In giving its findings at length in the order, the commission estimates the utility will reasonably require in materials and supplies and cash or its equivalent, the sum of $250,000 for the purposes of operation, including its maintenance of non-utility property, allowing $1,110,000 as a working capital for successful operation.

The cost of financing is allowed to remain as it stood in a former order of the commission. At that time the question of an allowance of 1.65 per cent under the head "cost of obtaining money," was considered, but the specific amount was disallowed, the overhead figures adopted in the former findings being deemed sufficient to cover this feature.

An allowance of slightly more than 6 per cent was made to the utility for interest during construction. The commission altered its former findings as to reproduction cost of the underground distribution system, the reproduction cost new as now found on this underground system being placed at $861,593 and the reproduction cost, less depreciation, at $891,385. The commission refused to include park and resort property as utility operating property.

COST OF PROPERTY TO INVESTORS

The cost of the property to present investors up to Dec. 31 is fixed by the commission at $51,001,147, there being added to the former finding $100,666, while the original cost is placed at $40,128,642. The amount and market value of the stocks and bonds of the company, as of Feb. 6, 1915, the latest date for which the record contains information on this point, were as follows:

	Par Value	Market Value
Portland Railway, Light & Power Company 5 per cent bonds, due 1942	$17,064,000	$14,419,080
Portland Railway, Light & Power Company, 5 per cent notes, due 1915	5,000,000	4,962,500
Portland Railway, Light & Power Company 5 per cent bonds, due 1930	8,523,000	8,448,424
Portland General Electric Company 5 per cent bonds, due 1935	8,000,000	7,900,000
City & Suburban Railway 6 per cent bonds, due 1916	87,000	87,000
City & Suburban Railway 4 per cent bonds, due 1930	1,290,000	1,120,300
Portland Railway, Light & Power Company common stock	25,000,000	6,250,000
Totals	$64,964,000	$43,186,304

In outlining the purposes for which the findings of value of the utility are made the commission says in part:

"It would appear that the Legislature, in drafting the act which clothes the commission with jurisdiction over railroads, . . . attempted to provide a means of perpetuating for all relevant purposes the various elements which enter into the various concepts to which the term 'value' has been applied. It is equally clear that in drafting the public utility act the Legislature had in mind the finding of an ultimate figure of value, and since the commission exercises no jurisdiction over the issuance of stocks and bonds, nor questions of taxation, nor proceedings looking to the fixing of values for purposes of sale or exchange, it is evident the 'value' contemplated by the Legislature is the value for rate-making purposes. This value, the commission conceives to be an expression in dollars of the aggregate of many factors, and represents, on the one hand, the amount upon which the utility owner is entitled to base a claim for a return, and, on the other hand, the amount upon which, provided it requires the imposition of no unreasonable, unjust nor unjustly discriminatory rates, the ratepayer should pay a return."

Public Beginning to Appreciate

A recent issue of the St. Joseph (Mo.) *Gazette* contained an editorial entitled "How Do They Do It?" which called attention to the fact that in spite of the increased cost of practically everything which the public must buy, the prices of electric railway transportation and electric lighting have remained constant. The editorial commented on the fact that all items of expense incident to the production of these necessities of modern civilization, including wages, material, fuel, rent, etc., have greatly increased, and yet the local company continues to furnish these commodities at rates which are the lowest they have ever been in that community. It also goes on to say that the conditions existing in St. Joseph are to be noted in most American municipalities, although the editors have noticed that in a few cases the "cut-rate street car books" have been withdrawn. The editorial ends with this comment: "How do the public service corporations supplying these commodities manage to maintain the old prices when the ice man, the coal dealer, the dairy man, the doctor, lawyer, merchant and chief all are boosting the prices of their own wares?"

Washington Men File Brief

A committee representing the striking employees of the Washington Railway & Electric Company, Washington, D. C., has filed its brief with the Senate investigating committee which is inquiring into the conduct of the recent strike. The brief of the company had been submitted previously, as noted in the ELECTRIC RAILWAY JOURNAL of May 5, page 840. The representatives of the men charge that President King of the company was "guilty of bad faith." They review the attempts at arbitration, and charge that the company is endeavoring to deceive Congress and the public with "constant assertions and paid newspaper advertisements that we insist upon a closed shop and an agreement with the Amalgamated Association." The communication asks that a recommendation be made for compulsory arbitration of all such disputes in the District.

The Senate investigating committee arranged to begin its hearings on May 8. The committee planned to sit only in the mornings before the sessions of the Senate and possibly at night if necessary.

Dearth of Help at Cleveland

Many of the motormen and conductors on the Cleveland (Ohio) Railway are giving up their places to go into other work. While the force is as large now as it was at this time last year, more cars are operated. A. E. Duty, general superintendent of the company, said that no cause can be given for the men leaving the service except "the man and the opportunity." Some of the men are going into shops where high wages are paid, while others are taking advantage of the various other opportunities that are offered. Fielder Sanders, street railway commissioner, said the situation is becoming so serious that women may have to be employed as conductors. Mr. Sanders says that if women are employed they should receive the same wages as the men. Mr. Sanders said on April 4 that 217 half trips had been taken off the service during the rush hours, because of the shortage of men. He also estimated that 650 motormen and conductors out of a total of 2500 are between the ages of twenty-one and twenty-seven years, first mentioned as the probable ages for conscription. This introduces still another danger to the service.

It is said that the conductors and motormen will ask the company for an increase in wages because of the abnormal increase in living expenses. Under their working contract the men received an increase of 1 cent an hour on May 1, but they say this will not be sufficient to meet the increase in the cost of food. They say now that the present abnormal conditions could not be foreseen when the contract was made and that the present wages are inadequate to their needs.

Council Approves Enabling Legislation

Power Required by Chicago in Order to Carry Out Traction and Subway Commission's Plans for Unified Transportation System Would Be Had by Passage of These Bills

After debate at which the Socialists and the advocates of immediate municipal ownership tried to influence the vote of the Aldermen by misinterpretation of the traction and subway commission's plans and a plea for no further franchises to utilities the Chicago City Council passed on four important bills for presentation at once to the State Legislature for consideration at the present session. These, if enacted into laws by the Assembly, will give the city the enabling legislation needed to proceed on a final solution of the local transportation problem. The four pieces of enabling legislation which have just been approved by the Council are as follows:

A bill restoring to the city the powers of home rule taken from it by the State public utilities act, and recently upheld by the State Supreme Court.

A bill authorizing the city to grant a thirty-year franchise to a new operating company formed by the merger of the elevated and surface lines.

A bill authorizing the city to construct and operate subways.

A bill authorizing the merger of the companies owning the surface and elevated lines, required because of their incorporation under different laws.

One of the principal reasons set forth by the immediate municipal ownership advocates as to why no new franchise grant should be given was the "rotten deal" the people had received as a result of the surface lines' operation under the 1907 ordinances. The sincerity of the Board of Supervising engineers was attacked. It was also asserted by the opponents of the legislative program that the members of the Board of Supervising Engineers were dominated by the traction interests.

District Valuations Announced

The Public Utilities Commission of the District of Columbia on May 2 announced complete valuations for rate-making purposes for the Potomac Electric Power Company, the Washington & Georgetown Gas Light Company and the Chesapeake & Potomac Telephone Company. The commission finds the value of the Potomac Electric Power Company, which is controlled by the Washington Railway & Electric Company, as of Dec. 31, 1916, to be $11,231,170. The company had claimed a value of $23,235,387 for its property.

Clarence P. King, president of the Potomac Electric Power Company, said on May 2 that he could not state what steps would be taken by the company until he had opportunity to go over the report. In announcing its findings the commission stated that it would hand down an opinion reviewing the problems presented in each case, within a few days.

This completes the valuation work, except for the properties of the Washington Railway & Electric Company and the Capital Traction Company now under investigation. Consideration of the rates charged for local utility service next is in order.

Chicago Men Seek Wage Increase

Present Contract Expires June 1, and Demand for 40 Per Cent Increase Will Shortly Be Made

The contract under which all elevated and surface trainmen in Chicago have been working expires on June 1. The unions have already prepared a demand for wage increases amounting to about 40 per cent, and also asking for shorter hours. The demand for wage increase will be for a raise from 36 cents an hour to 45 cents maximum during the first year of the agreement, and from 45 cents to 50 cents an hour during the second year. The wage scale at present is from 27 cents an hour to 36 cents distributed through four years.

The hours of work are to be determined on a basic eight-hour day, with a nine-hour maximum. Under the present agreement the men work under a basic ten-hour day. Night car runs are not to exceed six hours, and the men operating on them to receive $3.50 a run. Any runs necessitating more than eight hours are to be paid for at the rate of time and one-half for overtime. The demands will also contain other items as to the detail working conditions.

While the demands of the union have not been formally presented to the companies, their substance is expected to be approximately as itemized above. These are expected to be practically the same for both elevated and surface employees, although definite information on the former has not yet been made public.

Increase in Wages in York.—The directors of the York (Pa.) Railways have authorized an increase in the wages of the 200 employees, varying from 1 cent to 2 cents an hour.

Increase in Wages Sought in Olympia.—A petition, signed by the trainmen in the employ of the Olympia Light & Power Company, Olympia, Wash., requesting an increase of 5 cents an hour in wages, has been presented to L. B. Faulkner, manager.

Negotiations Continue in East St. Louis.—The conferences between the officers of the East St. Louis & Suburban Railway, East St. Louis, Ill., and the trainmen of the company over the working conditions of a new contract to take the place of the one that expired on May 1 were still being held on May 10.

Employees of Suburban Line Strike.—The employees of the Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio, who are members of the Amalgamated Association went on strike on April 28 to enforce recognition of the union and the reinstatement of their president, whom they contend was discharged because of his activity in behalf of the union.

Dynamiter Denied New Trial.—William Pollard, leader in the strike of the employees of the Georgia Railway & Power Company, who was convicted in the Superior Court on a charge of subornation of perjury, has been refused a new trial. He was charged with having aided in manufacturing an alibi for a striker arraigned on a charge of dynamiting during the walkout attempt in Atlanta.

New Wage Contract Submitted at Providence.—The local division of the Amalgamated Association has presented to the officers of the Rhode Island Company, Providence, R. I., a new working agreement calling for an increase in wages, the new contract to replace the present one, which expires on May 31. The company has a week in which to consider the matter and forward its reply.

Seventh Annual Prize Contest of Indiana Company.—The Union Traction Company of Indiana, Anderson, Ind., has announced the seventh annual prize essay contest for its employees. The subject for discussion will be "How Does the Obedient and Orderly Man Promote Safety First?" Prizes of $15, $10 and $5 in gold are offered by the company for the first, second and third best replies. The essays must be turned in before June 1.

Car-Full Jurisdiction Transferred.—The Assembly of New York has passed the bill of Senator Murphy of Brooklyn transferring from the local health authorities of New York and Buffalo to the Public Service Commission the power to regulate overcrowding on street cars. The bill, originally passed by the Senate, applying only to New York, was amended in the House so as to apply to Buffalo also, and now goes back to the Senate for concurrence in the amendment.

Committee Kills Corporation Tax in Pennsylvania.—The ways and means committee of the Pennsylvania House voted on May 8 to negative the Wallace bill proposing to make the property of public service corporations subject for local taxation. Adverse action by the committee virtually means that the measure is dead, since 104 votes would be required to place it upon the calendar. Representatives of the public service companies contend that since they pay a State tax they should be exempted from local taxation.

Strike Threatened at McAlester.—Employees of the Pittsburg County Electric Railway, McAlester, Okla., have presented demands for an increase in wages of 4 cents an hour for all motormen and conductors, with threats of a strike if the demands are not met. The company, through W. H. Vorce, general manager, offered an increase of 2 cents an hour for trainmen on two-men cars and 4 cents an hour for trainmen on one-man cars. The men declined to accept the compromise proposal and declared they would strike.

New Members Appointed to Indiana Commission.—On May 1 Governor James P. Goodrich appointed Ernest I. Lewis, John W. McCardle and William J. Wood as members of the Public Service Commission of Indiana to succeed Thomas Duncan and James L. Clark, whose terms had expired, and Edwin M. Lee, who had been removed by the Governor early in January. The new commission has organized by electing Mr. Lewis as chairman, and Carl H. Mote secretary. The hold-over members of the commission are Edwin Corr and Charles A. Edwards.

Philadelphia Hearings on May 18.—The proponents and opponents of the rapid transit program planned for Philadelphia are aligning their forces. The hearings are to begin on May 18. The proponents will then state their case. The objectors will be heard on May 25. The situation has been discussed at length at recent conferences between representatives of the city and officials of the Philadelphia Rapid Transit Company. Mayor Smith has announced that it has been decided to thresh out the whole matter before the joint committees of Councils on street railways and finance.

Toledo Problem Goes Back to Mr. Doherty.—After conferring with Attorneys Thurston and Emery of the Toledo Street Railway Commission, for two days on the wording of important clauses in the proposed community plan for settling the street railway matter at Toledo, Ohio, Judge D. C. Bailey, representing Henry L. Doherty, chairman of the board of the Toledo Railway & Light Company, decided he had not the power to act in the matters brought up and they will once more be referred to Mr. Doherty himself. It is expected that Mr. Doherty will visit Toledo again within a short time.

Seattle Municipal Railway Piles Up $105,120 Deficit.—According to figures filed by W. W. Clark and F. P. Mitten of the State Bureau of Inspection of Washington, the municipal street railway at Seattle shows a loss of $98,382 in operation for two years and seven months, from June 1, 1914, to Dec. 21, 1916. These figures are identical with the annual report of A. L. Valentine, superintendent of public utilities of that city. The first three months of 1917 added $6,738 to the loss, bringing the total to April 1 of this year to $105,120. The property as now operated comprises 13.2 miles of line.

Further Conferences at Tacoma.—A. L. Kempster, manager of the Puget Sound Traction, Light & Power Company, at a further conference between the City Councilmen of Seattle, Wash., and officials of the company, announced that the company stood willing to construct the Avalon Way cut-off as a more direct route for the Fauntleroy Avenue car line as soon as other questions now at issue between the city and company are settled. Mr. Kempster stated that industrial development in that district had reached a point to justify continuation of the present service to the heart of the district. The company is willing to grant the city common-user rights.

Progress on Oakland Indeterminate Franchise.—The committees which have been appointed by the Mayors of Oakland and Berkeley, Cal., to consider and pass upon the indeterminate franchise question, have organized and are working on a preliminary draft of the ordinance. The city of Alameda has organized under its new charter and the appointment of the committee is expected in the near future. The resettlement franchise bill which was unanimously passed by the State Legislature is now before the Governor for his approval. The settlements proposed to be made are with the San Francisco-Oakland Terminal Railways.

Increase in Wages in Portland.—An increase in wages of 3 cents an hour, amounting to more than $90,000 a year, has been granted by the Portland Railway, Light & Power Company, Portland, Ore., to its 1200 trainmen. The increase will go into effect on a graduated basis, the first increase of 2 cents an hour being effective on May 1 and the second increase of 1 cent an hour being in effect on Aug. 1, 1917. The increase will make the sliding scale of wages 28 to 34 cents an hour. In the past it has been 25 to 31 cents an hour. The new scale was arranged in agreement with the Brotherhood of Electric Railway Employees of the company.

Wires Ordered Underground in Frankfort.—An ordinance has been passed by the City Council of Frankfort, Ky., requiring that the electric distribution systems along portions of Main and St. Clair Streets be buried and, in addition, provides that along these same streets the Kentucky Traction & Terminal Company shall replace its wooden poles with ornamental steel poles. It is provided that the improvements shall be completed by April 1, 1918. The telephone and lighting companies will oppose the fulfillment of this program, in view of the fact that carrying out the plan would involve trenching a mile through solid limestone rock at very heavy expense.

Changes on the Key System.—Effective as of May 1, the efficiency department of the San Francisco-Oakland Terminal Railways, Oakland, Cal., was abolished as such. Hereafter the coasting recorder statistics will be kept by the auditor. Operating matters in connection with coasting instruction, records and the like, will be handled, as heretofore, by the transportation department under the jurisdiction of J. P. Potter, superintendent of transportation. U. S. Sliter, former superintendent of the efficiency department, and H. T. Brobeck, chief clerk to G. H. Harris, general superintendent, have been appointed assistant superintendents of transportation.

Electrification Plans Progressing Slowly.—The annual report of the Pennsylvania Railroad for the year ended Dec. 31, 1916, contains the following reference to the proposed Allegheny electrification: "No work was undertaken during the year on the proposed electrification of your main line across the Allegheny Mountains between Altoona and Conemaugh, beyond designing and constructing the type of electric locomotives required, continuing the detailed surveys and obtaining the experience of other lines in the use of electric traction for heavy freight and passenger trains. Scarcity of labor and the high cost of construction materials also made it desirable not to urge this improvement."

Sunday Prays for Interborough Men.—May 2 was Interborough night at the Billy Sunday tabernacle. Several thousand employees of the elevated and subway lines and the families of the employees attended the service in a body. Many of the executive officers of the company and the subway band were in the delegation. Among the 1452 "trail hitters" who went forward were H. H. Vreeland, former president of the Metropolitan Street Railway, now in charge of the Interborough welfare work, and A. L. Merritt, superintendent of the Subway. Sunday said that he knew Theodore P. Shonts, president of the Interborough, when Mr. Shonts was railroading in Iowa years ago. In concluding his prayer Sunday said: "I pray for these men and women from the Interborough. Bless the boys of the band who have come out to-night in their white uniforms looking like big snowflakes."

Women Conductors to Be Tried.—Unable to secure sufficient men to operate its cars, the Corning & Painted Post Street Railway, Corning, N. Y., intends to employ women as conductors on its Corning local lines. Last fall the men asked for a wage increase, with a minimum of 26 cents an hour. The company agreed to grant a wage increase based on seniority with a maximum wage of 26 cents an hour. The platform men agreed to accept this scale temporarily. Several weeks ago the company placed in operation a number of one-man cars on its Corning local lines, but the city authorities refused to allow the company to operate these cars. After a series of conferences between J. R. Empey, general superintendent of the company, and the city officials, the company announced it was not financially able further to increase the wages of the platform employees and signified its intention to try women conductors. Four women will be employed to serve on runs during off hours to determine how the plan works out.

Wage Increase at Colorado Springs.—The Colorado Springs (Col.) Interurban Railway increased the wages of its trainmen on May 1. The old rate was 25 cents an hour for the first two-year period, 27 cents for the third and fourth years, 28 cents for the fifth and 30 cents thereafter. Under the new rate the men will receive 25 cents an hour for the first year, 26 cents for the second year, 28 cents the third year, 30 cents the fourth year and 32 cents thereafter. An unusual circumstance in connection with this wage increase is the fact that the 136 trainmen now employed by the company are all maximum rate men, so that the wage rate for the entire force of trainmen will be 32 cents an hour. On June 1 the company will add to its force about twenty men who were laid off last fall after the tourist season closed. None of these men will be under two-year men. The earnings of the company did not justify the increase, but the company granted the raise voluntarily, because of the greatly increased cost of living.

Programs of Association Meetings

Iowa Electric Railway Association

At the meeting of the Iowa Electric Railway Association, at Des Moines, Ia., on May 24 and 25, the following program of papers will be presented:

"How Should the Electric Railway Manager Anticipate the Effects of the War?" by C. E. Fahrney, general manager of the Ottumwa Railway & Light Company.

"Is the A. E. R. A. Question Box Fulfilling Its Purpose?" by Scott H. Bluett, of the American Car & Foundry Company.

"Application of Automatic Substations to Interurban Operation," by W. A. Clough, of the General Electric Company, with discussion by F. C. Chambers, of the Des Moines City Railway.

"Safety Devices for One-Man Operation," by C. H. Beck, of the Westinghouse Traction Brake Company.

American Institute of Electrical Engineers

The annual convention of the American Institute of Electrical Engineers will be held at the Homestead Hotel, Hot Springs, Va., June 26 to 29. The convention will open on the afternoon of June 26 with President H. W. Buck's address, followed by the reports of the various technical committees. The two sessions on June 27 will be under the auspices of the transmission and distribution committee. The morning session of June 28 has been designated as the mining session. The fifth and last technical session will be held on June 29. The general subject of this session will be inductive interference between railway and telephone lines. The tentative list of convention papers for the first four sessions has been confirmed. The paper for the fifth session will be "Economical Combination of Water Power and Steam Plant and a Simple Method of Solution," by H. S. Putnam.

The annual business meeting of the institute will be held in the auditorium of the Engineering Societies Building on May 18. The board of directors will present its report for the fiscal year ended April 30, 1917. The seventh Edison medal, which was awarded to Nicola Tesla on Dec. 13, 1916, "for meritorius achievements in his early original work in polyphase and high-frequency electric currents," will be presented to Mr. Tesla at the annual meeting.

Financial and Corporate

Annual Reports

Public Service Corporation of New Jersey

The income statement of the Public Service Corporation of New Jersey, Newark, N. J., for the year ended Dec. 31, 1916, follows:

Operating revenue of subsidiary companies		$42,548,775
Operating expenses, including amortization charges and taxes		25,863,854
Operating income		$16,684,921
Non-operating income		516,529
Gross income		$17,201,450
Income deductions of subsidiary companies (bond interest, rentals and miscellaneous interest charges)		11,963,114
Net income of subsidiary companies		$5,238,336
Public Service Corporation income from securities pledged (exclusive of dividends on stocks of operating companies) and from miscellaneous sources	$1,965,421	
Less expenses and taxes	162,885	1,802,536
		$7,040,872
Public Service Corporation income deductions:		
Interest charges	$3,678,876	
Amortization of debt discount and expense	174,088	
Sinking fund for Public Service general mortgage 5 per cent bonds	209,500	
Other contractual deductions from income	36,540	4,099,005
Net income of Public Service Corporation and subsidiary companies		$2,941,867
Appropriation accounts of subsidiary companies:		
Amortization of new business expenditures prior to Jan. 1, 1911	$40,330	
Adjustments of surplus account (credit)	118,984	78,654
		$3,020,521
Appropriation accounts of Public Service Corporation (exclusive of dividends)		72,828
Net increase in surplus before payment of dividends		$2,947,693

Dividends at the rate of 7 per cent per annum for the first quarter of the year, and at the rate of 8 per cent per annum for the last three-quarters of the year, aggregating $1,937,500, were paid upon the capital stock of the corporation, amounting to $25,000,000 at par.

The corporation shared in the general prosperity prevalent throughout the country. The total operating revenue of subsidiary companies amounted to $42,548,775, an increase of $5,077,546, or 13.6 per cent. The operating revenues for the three major subsidiaries and their affiliated companies for 1916, with the amount of increase and the percentage of increase over the previous year, are as follows:

	Operating Revenue	Amount of Increase Over Previous Year	Percentage of Increase
Public Service Railway	$18,175,764	$1,606.321	9.7
Public Service Electric Co.	12,814,597	2,388,745	22.9
Public Service Gas Company	11,558,413	1,082,479	10.3

The foregoing figures of increase, it is said, are highly satisfactory but are abnormal. All three of the companies shared in the prosperity, but the increase in the electric company's business is described as being little less than phenomenal.

The annual report states that during the last two years jitney operation undoubtedly diverted a very large revenue from the railway. That this industry can ever seriously impair the activities and future development of the railway, however, is not believed by those who have been closely watching the current of events during the last year. The revenues of the company were also seriously affected during the summer by the prevalence of the infantile paralysis epidemic, which closed many pleasure resorts and completely paralyzed juvenile riding. The operating people feel confident that the company lost a revenue of at least $250,000 from this cause.

The revenue from transportation increased from 30.540 cents per car-mile to 31.412 cents per car-mile, or 0.872 cents per car-mile. Operating revenue deductions increased from 19.603 cents per car-mile to 20.354 cents per car-mile. The ratio of operating revenue deductions to operating revenue was 63.7 per cent. Car mileage increased 6.0 per cent. Other statistics follow:

	1916	1915
Revenue passengers	342,205,993	313,923,363
Transfers and passes	109,492,019	100,498,677
Total passengers	451,698,012	414,422,040
Percentage of passengers using transfers	21.8	21.5
Average fare per passenger (cents)	3.82	3.82
Car mileage	54,964,708	51,873,660
Passenger receipts per car-mile (cents)	31.37	30.49
Passenger receipts per car-hour (dollars)	2.92	2.84

The taxes for 1916 amounted to $2,713,059, an increase of $396,093, or more than 17 per cent. Fire insurance carried on Dec. 31, 1916, was $32,951,036, an increase of $2,731,357. The average rate in 1916 was 32.3 cents per $100 of insurance as compared to 34 cents in 1915. The net addition to fixed capital during 1916 was $7,236,259, of which $2,303,837 was for the railway department.

The total expenditures of the welfare department for insurance, sick benefits, pensions and expenses for 1916 were $88,368, an increase over the previous year of $12,263. The cost of accidents arising under the workmen's compensation act was $77,436, an increase of $17,949 over the year preceding. The total was divided as follows: Payments as required by act, $57,904; additional payments over and above those required by act, $7,047, and expenses of department, $12,484; total, $77,436.

Washington Water Power Company

The income, profit and loss statement of the Washington Water Power Company, Spokane, Wash., for the year ended Dec. 31, 1916, follows:

Gross operating revenue	$2,676,056
Interest on current balances	8,968
Total revenues	$2,685,024
Operating expenses, including taxes	1,328,669
Net revenues	$1,356,355
Interest on bonds	328,869
Interest on notes and loans	99,384
Premium on $117,000 bonds bought for sinking fund	259
Annual credit to amortization fund for discount on first refunding mortgage bonds	9,808
Interest on consumers' deposits, etc	1,035
Written off for replacement reserve	325,000
Uncollectible accounts, etc	5,037
Total	$769,392
Net income	$586,963
Surplus from 1915	986,945
	$1,573,908
Dividends	658,325
	$915,583
Credit adjustments prior to 1916	7,212
Surplus Dec. 31, 1916	$922,795

No separate figures are given in this company's report for light and power and for railway earnings. It is stated, however, that jitney competition continued with little change from that in 1915. In that year the railway traffic fell off and the receipts decreased 13 per cent on account of jitney competition and the increasing number of private automobiles. In 1916 the total of passengers carried on the city lines declined still farther by 112,903 to 15,601,850, the smallest traffic total since 1907. During the last year, however, the car-miles run on all the lines rose from 3,612,993 to 3,666,944, and the car-hours showed an increase from 407,157 to 413,259.

The gross operating revenues of the company fell off $67,820, or 2.5 per cent, while the net revenues decreased $154,625, or 10.2 per cent. The total output of the light and power system for 1916 was 162,825,400 kw.-hr., a decrease of 1.86 per cent. Lighting and power revenues in the country districts increased 10 per cent, but reductions in rates brought down the Spokane total, and the power business in the Coeur d'Alene mining district showed a decrease of 8.4 per cent.

During 1916 the company expended $27,212 for capital purposes on the railway system and $293,670 on the lighting and power system. The book values of the two classes of property on Dec. 31, 1916, were as follows: Electric light and power, $21,102,735; street railway (city and interurban), $4,793,912.

Underground Electric Railways of London, Ltd.

The total income of the Underground Electric Railways of London, Ltd., London, England, for the calendar year 1916 totaled £653,361, as compared to £680,741 for 1915, a decrease of £27,380, or 4.02 per cent. The reduction in revenues from the subsidiary companies (for their report see Electric Railway Journal of March 17) may be seen from the following summary:

	1916	1915
Revenue:		
London Electric Railway	£147,804	£143,242
District Railway	36,619	40,950
City & South London Railway	31,809	14,832
London General Omnibus Company	128,038	192,058
Metropolitan Railway	151	177
London & Suburban Traction Company	5,889	6,586
Associated Equipment Company	143,000	170,000
Sundries (including income-tax returnable)	160,051	112,896
Total	£653,361	£680,741
Appropriations:		
Directors', etc., fees and expenses	£6,981	£11,813
Loss on foreign exchange	20,289	.....
Interest on 4½ per cent bonds	106,508	95,252
Interest on 4½ per cent 3-year secured notes	31,500	31,500
Central London guarantee	13,466	26,931
Interest on 6 per cent income stock	76,380	76,380
Interest on 6 per cent income bonds (1916, 5 per cent; 1915, 6 per cent)	406,178	438,731
Change in balance forward	—£7,942	+£134

Besides the falling off in subsidiary revenues, there was, as above indicated, a large loss on foreign exchange and increased income tax. The income tax on the interest on the 4½ per cent bonds and the 6 per cent income bonds, together with the loss on foreign exchange in respect to coupons cashed abroad, was £134,015, an increase of £56,805, or 73.57 per cent.

At the annual meeting of the company it was stated that the greatest obstacle to the increased prosperity of the subsidiaries at the present time is the increased cost of operation. Last September the railways were obliged to grant an additional bonus to their employees. Coal has increased in price to more than double the pre-war level, and it is still rising. Under a recent order of the government in regard to the use of advertising posters, the display of posters is prohibited in many cases, and it is likely that there will be a loss of a large part of the £100,000 of revenue from the company's advertising in stations, cars, elevators and omnibuses. These factors, it was said, will probably compel the companies to consider a fare readjustment.

Toronto Railway

The comparative income statement of the Toronto (Ont.) Railway for the years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	$5,973,161	100.0	$5,694,136	100.0
Operating expenses	3,350,658	56.1	3,250,612	57.1
Net earnings	$2,622,503	43.9	$2,443,524	42.9
Interest on bonds	$156,122	2.6	$167,357	2.9
Percentage on earnings	909,881	15.2	868,254	15.2
Pavements, taxes	215,707	3.6	215,424	3.8
Total	$1,281,710	21.4	$1,251,035	21.9
Surplus earnings	$1,340,793	22.5	$1,192,489	21.0

Although the gross earnings of the company for the calendar year 1916 did not show a return to the high figures of $6,127,096 in 1914 and $6,099,018 in 1913, the net earnings showed a gain over those of $2,597,550 in 1914, which was the highest record of net earnings since 1906, with the exception of $2,925,710 in 1913. As compared to the preceding fiscal year, the increase in 1916 in passenger earnings amounted to $270,208, or 4.7 per cent, while the increase in gross earnings was $279,025, or 4.9 per cent. The operating expenses rose only $100,046, or 3.7 per cent, so that the ratio of expenses to passenger earnings was 57 per cent in 1916, as compared to 57.9 per cent in 1915.

The net earnings for the last fiscal year showed a gain of $178,979, or 7.3 per cent over those in 1915. The decreased interest charges on bonds were more than offset by the higher percentage payment on earnings, but the surplus earnings after payment of all expenses, interest, taxes, etc., showed an increase of $148,304, or 12.4 per cent over those for the preceding year. After adding the surplus at the beginning of the year and deducting the regular dividend of 8 per cent, the surplus carried forward at the end of the year totaled $5,408,874, as compared to $5,026,907 the year before.

The passengers carried in 1916 totaled 149,529,754, an increase of 7,468,496 over those in 1915, while the transfers numbered 61,342,673, a decrease of 1,055,875 from the 1915 figure. The number of passengers carried was greater than in any preceding year since 1906 with the exception of 1913 and 1914, when the totals were 151,236,925 and 152,966,153 respectively.

Almost at the close of the year the company suffered a loss by fire. On Dec. 28 a fire in the carhouse at St. Lawrence and King Streets completely destroyed the building and contents, including 168 cars.

Purchase Rumors Denied

The passage of the charter amendments of the Shore Line Electric Railway, referred to in the Electric Railway Journal of May 5, page 844, and the statements made in behalf of the New Haven Railroad in connection with the application of that company to issue preferred stock, have resulted in various rumors in regard to the final lodgment of the electric railway holdings of the New Haven under the agreement reached by that company some time ago with the Government for the disposition of its so-called outside holdings, among which are the Connecticut Company and the Rhode Island Company, operating the electric railways in Connecticut and Rhode Island respectively controlled by the New Haven. Coupled perhaps most frequently with these rumors has been the name of Morton F. Plant, New London, Conn., millionaire railroad operator and director of the Shore Line Electric Railway. Efforts made by the Providence *Tribune* to reach Mr. Plant regarding these rumors as concerned the Rhode Island Company have resulted in their denial by him. The *Tribune* quotes Mr. Plant as follows:

"I do not know anything about the report. If there was any foundation for the story I suppose I would know something about it."

Mr. Plant was then informed that it was reported that he was to purchase the Rhode Island Company as part of a general plan comprehending the taking over of all the electric railways between New York and Boston. To that he is reported to have replied:

"There is absolutely no foundation for this story."

American Cities Company, New York, N. Y.—The gross earnings from all sources of the combined constituent companies of the American Cities Company amounted in 1916 to $15,464,361, as compared to $14,145,442 in 1915, an increase for the last year of 9.3 per cent. This compares with a decrease of 4.3 per cent in 1915 and is the largest increase since 1907. Operating expenses and taxes rose from $9,121,734 in 1915 to $9,965,083 in 1916, so that the net earnings at $5,499,278 represented a gain of 9.4 per cent. After deducting $3,810,259 for interest, bond discount, amortization and miscellaneous, the amount applicable to stock dividends was $1,689,019 in 1916 as compared to $1,366,510 in 1915, an increase of $322,509.

Birmingham (Ala.) Tidewater Railway.—First mortgage 5 per cent gold bonds of the Birmingham Tidewater Railway, the successor to the Birmingham, Ensley & Bessemer Railway, are being offered by Howard R. Taylor & Company, Baltimore, Md. The bonds are guaranteed as to principal and interest by the Birmingham Railway, Light & Power Company, which owns the stock of the Birmingham Tidewater Railway. The bonds are dated Jan. 1, 1916, and are due on Jan. 1, 1946. The amount authorized is $4,000,000 and the amount issued $1,500,000.

Boston & Worcester Street Railway, Boston, Mass.—The Boston & Worcester Street Railway has been authorized by the Massachusetts Public Service Commission to issue $270,000 of additional preferred stock and $40,000 of additional first mortgage bonds, which will make $667,000 of stock and $2,440,000 of bonds outstanding respectively.

Boston (Mass.) Elevated Railway.—The Senate committee on ways and means reported favorably on May 7 the report of the committee on metropolitan affairs recommending legislation to benefit the Boston Elevated Railway. The $15,000 appropriation for a further investigation of the affairs of the Boston Elevated Railway was eliminated by the committee.

Central Park, North & East River Railroads, New York, N. Y.—Newton M. Hudson, who is auditor of the Second Avenue Railroad, has been appointed receiver of the Central Park, North & East River Railroad. The property of this company was sold under foreclosure in 1912 and is now owned by the Belt Line Railway Corporation, a subsidiary of the Third Avenue Railway. The organization of the Central Park, North & East River Railroad is maintained to wind up the affairs of the company.

Hagerstown & Frederick Railway, Frederick, Md.—A special meeting of the stockholders of the Hagerstown & Frederick Railway was called for May 7 to consider a plan for the reduction and readjustment of the company's capitalization. The plan provides for the retirement of the present outstanding $1,225,000 of 5 per cent convertible adjustment bonds, the $635,000 of 7 per cent cumulative preferred stock and the $2,000,000 of common stock and the issuance in lieu thereof of $600,000 of ten-year 6 per cent notes, $842,500 of 6 per cent cumulative preferred stock and $1,483,500 of new common stock. The plan provides for the conversion of a portion of the old preferred stock and the reduction of the common stockholdings to one-third the present amount.

Hudson Companies, New York, N. Y.—A plan for certain financial readjustments affecting the Hudson Companies has been advanced by Walter G. Oakman, president. The concern is a holding company. It owns a majority of the stock of the Hudson & Manhattan Railroad and also controls the Greeley Square Realty Company, the property of which is leased to Gimbel Brothers as a site for their store, and other buildings at Sixth Avenue and Thirty-third Street. It is pointed out to stockholders that the Hudson Companies owes $1,950,000 which will mature during 1918. It is suggested that the Hudson Companies transfer its Greeley Company bonds and stocks and its interest in the Greeley Company first mortgage and any of that company's first refunding bonds to the Greeley-Hudson Securities Company, newly organized in an exchange plan set forth in detail by Mr. Oakman. After the consummation of the plan the Hudson Companies will still own its Hudson & Manhattan Railroad stocks and any of the $2,000,000 of stock of the new company not sold with the notes. In regard to the effect of the plan Mr. Oakman said in part: "Your directors are assured that, if this plan becomes effective, the common stock of the Hudson Companies will be surrendered and canceled, whereupon it will be in order to reduce the preferred stock and distribute to the holders thereof such remainder of the capital stock of the new company, the Hudson Companies retaining the said railroad company holdings. To have this 'control' of the Hudson & Manhattan Railroad thus set free from all lien or debt and held together for future realization is obviously of great advantage."

Kanawha Traction & Electric Company, Parkersburg, W. Va.—The Fidelity Trust Company, Baltimore, Md., has issued a circular describing the first and refunding mortgage 5 per cent gold bonds, Series A, of the Kanawha Traction & Electric Company. These bonds are dated Aug. 1, 1916, and are due on Aug. 1, 1936. The proceeds of the bonds now sold will be used to retire $150,000 of first mortgage 6 per cent bonds of the Marietta Electric Company, due April 1, 1917; $1,100,000 of two-year 5 per cent notes due June 15, 1917, and for other corporate purposes. Reference to the filing of the mortgage securing the bonds was made in the ELECTRIC RAILWAY JOURNAL of Aug. 26, 1916, page 375.

Long Island Railroad, New York, N. Y.—According to its annual report for the calendar year 1916, the Long Island Railroad during the last year carried 45,802,722 passengers and 5,134,838 tons of freight, or 3,173,397 more passengers rode and 691,505 more tons of freight were hauled than in the preceding year. The heavy traffic of the year was reflected in the gross earnings from railroad operation, which amounted to $14,971,838, an increase of 10 per cent. Railway operating expenses also increased heavily, reaching a total of $9,927,207, or $800,285 greater than in 1915. The company earned as a result of the year's operation, a net income of $241,735. This represented a return of 2 per cent on the outstanding capital stock, and compares with a deficit of $161,083 incurred in 1915. Contracts made during the year for new equipment to be delivered in 1917 included forty-five steel passenger cars for electric service. In addition to these, out of equipment ordered for completion in 1916 there remained undelivered at the end of the year twenty-five steel passenger cars for electric service.

Orleans-Kenner Electric Railway, New Orleans, La.—Harry K. Johnson, promoter of the Orleans-Kenner Electric Railway, has issued the following statement in regard to the disposition of the property of the company: "On the strength of a statement by Francis T. Homer, of the firm of Bertron, Griscom & Company, New York, that he would allow the property owners of Jefferson to purchase the controlling interest in the Orleans-Kenner Electric Railway, which he had secured from Johnson & Company, Inc., builders and owners of the Orleans-Kenner Electric Railway, a syndicate was formed by Allen H. Johness, president of the General Realty Company, for this purpose. I understand that the stock in the new company organized by Mr. Johness has been considerably over-subscribed. Papers in connection with the deal have been signed and the new company is prepared to pay over the money. The amount involved is approximately $500,000, exclusive of money for development, which, I understand, has been taken care of by the subscribers."

New York (N. Y.) Railways.—The Public Service Commission for the First District of New York has granted the application of the New York Railways for authority to purchase 6842 of the 9000 shares of the Bleecker Street & Fulton Ferry Railroad on which it had an option. The company will pay $28.50 per share, and will give the same amount for the remaining shares if deposited within a reasonable time.

Philadelphia Company, Pittsburgh, Pa.—Ladenburg, Thalmann & Company, Blair & Company and Hayden, Stone & Company have announced to the holders of the first mortgage and collateral trust 5 per cent gold bonds of the Philadelphia Company, due March 1, 1949, and of the consolidated mortgage and collateral trust 5 per cent gold bonds due Nov. 1, 1951, that they have extended until May 31 the time within which deposits of these bonds may be made. More than 65 per cent of the first mortgage bonds and more than 70 per cent of the consolidated mortgage bonds had been deposited up to May 1. The deposit of these securities has been asked in connection with the sinking fund and redemption plan referred to briefly in the ELECTRIC RAILWAY JOURNAL of March 10, page 456.

Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y.—The Poughkeepsie City & Wappingers Falls Electric Railway has increased its capital stock from $750,000 to $1,000,000.

Richmond Light & Railroad Company, Richmond, S. I., N. Y.—The application of the Richmond Light & Railroad Company and the Staten Island Midland Railway for permission to consolidate was refused on May 10 by the Public Service Commission for the First District of New York. The opinion of the commission was written by Commissioner Hervey. He said that no evidence had been submitted to show that the bonds to be refunded had been issued for capital purposes. He also said that it was incumbent upon the company to prove that the obligations proposed to be discharged or refunded were not only actual obligations but were issued for capital purposes.

Scranton (Pa.) Railway.—Newburger, Henderson & Loeb and Bioren & Company, Philadelphia, Pa., are offering at 94 and interest $2,500,000 of first and refunding 5 per cent thirty-year gold bonds of the Scranton Railway, dated Feb. 1, 1917. The bonds are guaranteed as to principal and interest by indorsement by the American Railways. They are redeemable after Feb. 1, 1922, at 102½ and interest.

Second Avenue Railroad, New York, N. Y.—Andrew E. Kalbach has been named as receiver of the Second Avenue Railroad by Justice Giegerich, of the Supreme Court, in place of John Beaver, deceased.

Tidewater Power Company, Wilmington, N. C.—Hugh McRae, president of the Tidewater Power Company, has addressed a letter to the stockholders of the company, in which he advises them of the sale of his interest in the company to Brooks & Company, Scranton, Pa., noted in the ELECTRIC RAILWAY JOURNAL of April 21, page 754. The company has $595,000 of 6 per cent preferred stock and $600,000 of common stock outstanding. On the common dividends at the rate of 7 per cent are being paid. Mr. McRae says that holders of common stock may dispose of their interest to Brooks & Company at $105 a share, payable in negotiable notes, one for one-half the purchase price payable on or before Nov. 16, 1919, and one for the balance of the purchase price payable on or before May 16, 1920, with interest on deferred payments at 6 per cent per annum. Mr. McRae says that in addition Brooks & Company further agree to transfer certain real estate now owned by the Tidewater Power Company to the present stockholders of the company as an additional payment on the stock.

Dividends Declared

Boston (Mass.) Elevated Railway, quarterly, 50 cents.

Cumberland County Power & Light Company, Portland, Maine, quarterly, 1½ per cent, preferred.

Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.

Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1½ per cent, original preferred; quarterly, 1½ per cent, first preferred.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.						
1m., Mar.,	'17	$163,197	$123,232	$39,965	$36,036	$3.929
1 " "	'16	146,546	*102,400	44,146	36,511	7,635
3 " "	'17	469,516	*352,564	116,952	107,447	9,505
3 " "	'16	439,640	*301,277	138,363	109,698	28,665
BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.						
1m., Mar.,	'17	$87,360	*$73,767	$13,593	$27,550	†‡$13,900
1 " "	'16	72,293	*66,603	5,690	22,304	†‡16,380
3 " "	'17	245,482	*214,329	31,153	82,650	†‡51,208
3 " "	'16	212,396	*194,471	17,925	66,935	†‡48,407
CONNECTICUT COMPANY, NEW HAVEN, CONN.						
1m., Mar.,	'17	$806,909	*$613,297	$193,612	$96,782	‡$119,176
1 " "	'16	751,504	*545,299	206,205	97,847	‡130,775
3 " "	'17	2,314,102	*1,847,562	466,540	287,846	‡215,983
3 " "	'16	2,134,382	*1,503,516	630,866	293,902	‡404,765
KANSAS CITY (MO.) RAILWAYS						
1m., Mar.,	'17	$637,053	*$412,659	$224,394	$129,760	**$40,334
1 " "	'16	585,754	*367,216	218,538	115,333	**51,659
9 " "	'17	5,554,695	*3,688,268	1,866,427	1,171,100	**351,709
9 " "	'16	††				
NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.						
1m., Mar.,	'17	$27,317	*$35,078	†$7,761	$7,987	†‡$15,704
1 " "	'16	24,955	*22,691	2,264	7,979	†‡5,678
3 " "	'17	77,310	*85,388	†8,078	23,961	†‡31,921
3 " "	'16	71,420	*68,200	3,220	23,960	†‡20,624
NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.						
1m., Mar.,	'17	$45,164	*$47,371	†$2,207	§$6.179	†‡$7,635
1 " "	'16	39,834	*46,536	†6,702	§5.997	†‡10.986
3 " "	'17	130,528	*141,319	†10,791	§22,863	†‡29,638
3 " "	'16	118,018	*171,121	†53,103	§22,170	†‡70,121
RHODE ISLAND COMPANY, PROVIDENCE, R. I.						
1m., Mar.,	'17	$478,057	*$389,422	$88,635	$119,285	†‡$30,040
1 " "	'16	451,308	*355,741	95,567	118.373	†‡21,828
3 " "	'17	1,368,320	*1,127,865	240,455	357,508	†‡87,235
3 " "	'16	1,290,381	*1,042,231	248,150	320,140	†‡42,611
WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.						
1m., Mar.,	'17	$18,849	*$23,799	†$4,950	$2,018	†‡$6.939
1 " "	'16	17,997	*18,657	†660	1,748	†‡2,383
3 " "	'17	50,411	*64,855	†14,444	6,055	†‡20,417
3 " "	'16	52,618	*61,216	†8,598	5,196	†‡13,717

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*Includes taxes. †Deficit. ‡Includes non-operating income. §Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad not credited to income of that company. **Includes addition of miscellaneous income, and deduction of Kansas City surplus reinvested in plant. ††During the fiscal year to Feb. 14, 1916, the property was operated by the receivers under the old securities, and the figures for this period, being without value in a comparative statement, are not shown here.

Traffic and Transportation

Atlantic City Ordinance Bars Jitneys

Commission of That City Decides Against Their Operation on Principal Street and Fixes License Fee

At a hearing April 26 on the controversy between the Atlantic City & Shore Railroad, Atlantic City, N. J., and the local Association of Jitney Owners before the City Commissioners an ordinance was passed which prevents jitneys from operating on Atlantic Avenue, the principal business street. The commissioners passed also a companion bill which will compel jitneys to pay an annual license fee of $50 instead of 5 per cent of their gross receipts. Officers of the jitney owners' association declared that the two measures, which became effective on May 7, sound the death-knell of independent transportation in Atlantic City.

Clarence L. Cole, receiver and counsel for the trolley company, urged the elimination of the jitney from Atlantic Avenue in order that the company could rehabilitate itself. He said that the company as well as its predecessors had realized no profit, but besides contributing to the welfare of the city had kept pace with its growth and development. He said that three of the local lines had been operated at a loss which amounted to $50,000 the past year. Prior to the advent of jitney competition the company had 300 employees and paid $184,000 annually in salaries. This amount was decreased $20,000 last year through compulsory retrenchment. The company pays $34,000 a year in State and city taxes on a total investment of $500,000. Mr. Cole said further that the West Jersey & Seashore Railroad, which built the trolley line, paid $150,000 annually for ten years for maintenance besides building its roadbed at a cost of $300,000. These outlays, he maintained, placed the city under moral obligation to give the company exclusive transportation privileges for the same reason that the Public Utility Commission would refuse to franchise a competing line.

Attorney S. Cameron Hinkle, counsel for the jitney association, said that he believed the jitneys should be given due consideration in view of the great popularity of the cars. He urged that the public interest be considered and declared that elimination of the jitney would materially cripple the city's transportation facilities.

A delegation of the jitney men has since submitted to the commission 140 petitions bearing about 4700 names which asked for a referendum vote on the ordinance. The petitions were not accepted on account of an opinion issued by City Solicitor Wootton, which stated the ruling ordinance was passed pursuant to the provisions of a State-wide act not subject to referendum or recall. The jitney men intend to investigate the possible recourses left to them and take further action in the matter.

Chicago Surface Traffic Improved

Police Enforce New Ordinances—Street Cars Attain an Unprecedented Schedule Speed

The new traffic ordinances now in effect in Chicago which define car "loading zones" and prohibit the parking of vehicles on the car-line streets in the loop district during rush hours greatly facilitate the movement of cars and vehicles in general. The marked increase in the speed of cars has caused much comment on the part of pedestrians and passengers of vehicles. Street cars are enabled to run on a schedule speed never before attained in this district. The ordinances became effective on May 1 and were quoted in the ELECTRIC RAILWAY JOURNAL for May 5, page 847. President Leonard A. Busby of the Chicago Surface Lines made the following statement commenting on the results of the new ordinances:

"Conditions in the loop during the evening rush hours are better than they have been for years. The congestion is materially reduced. The cars are loaded more quickly and more safely. Instead of lines of cars standing idle or creeping into the loop as heretofore, the cars get into the loop promptly, are loaded quickly and proceed from the loop much quicker than usual. This means that the people get home more quickly and more comfortably. All of this is due to the prompt enforcement by the police of the new anti-parking and 'loading zone' ordinances.

"The conductors and motormen are more than pleased at the new conditions, which enable them to perform their duties much more satisfactorily to the public, and they take a keen interest in the enforcement of the ordinances. The improvement in conditions is so marked, and the benefit to the public so great, that I believe everyone will gladly continue to co-operate in this matter, and in time extend the reform still further."

Mr. Loree Suggests More Revenues

Believes Application for 6-Cent Fare Would Be Sympathetically Received by Commission

President L. F. Loree, speaking to stockholders of the Delaware & Hudson Company at the annual meeting on May 8, stated that the electric railway investments of his company seem to have passed through their worst period, but that the companies need additional compensation to cover the higher costs which they are being required to meet. He believed that a 6-cent fare application would be sympathetically received by the Public Service Commission for the Second District of New York.

Mr. Loree made four suggestions, some of which he hoped would be favorably received by the commission, whereby the electric lines may receive needed compensation for the higher costs which they have to meet. These suggestions are as follows:

1. Readjustment of present requirements for street paving. The cost to the United Traction Company on account of the rule that they must pave between the tracks and to a point 18 in. on either side has amounted to $200,000 a year. Mr. Loree pointed out that this requirement is a heritage from horse-car days, when the traction companies did wear out the pavement; but that under present conditions there is no wear and tear on the pavement by the street railways.
2. A charge for a transfer. A 2-cent charge for a transfer, Mr. Loree said, would help the companies substantially.
3. A 10-cent fare for patrons of the line between midnight and 6 a.m. Night service is expensive to maintain, and while doubling of the fare would not aggregate much in total, it would be helpful.
4. A 6-cent fare. Wages on the Delaware & Hudson electric lines have advanced 40 per cent and materials 60 per cent in the last five years, while rates have remained stationary.

Seven-Cent Fare Unit Granted

City Officials and Representatives of the Public at the Hearing Approve Fare Increase

A general fare increase to 7 cents instead of the present 5-cent unit has been allowed by the Public Service Commission of Massachusetts in the case of the Norwood, Canton & Sharon Street Railway, Canton, Mass. The company is also authorized to sell ten tickets for 65 cents and sixteen for $1. School tickets will be sold at the rate of ten tickets for 35 cents instead of 25 cents as formerly. The road is about 6.25 miles long, in two parts, which are separated by the Blue Hill Street Railway. During 1916 the operating revenue was $10,874, while the operating expenses were $13,432. During the first eleven years of operation and in 1916 the company failed to earn operating expenses, and no dividends have ever been paid. The hearing on this case was reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 17, page 322.

The commission found in its investigation that the company has been operating at a relatively low cost, and that no substantial saving can be made through increased economies in operation. The cost of power is relatively high, but the company is obliged to buy its power and claims that no more advantageous arrangement can be made. Poor track and equipment are factors producing the high cost of power per car-mile. The commission held that a total expenditure of at least $6,000 per year for the next three to five years should be made on the property. Later the annual maintenance charge would probably be about $3,000, besides about $3,000 to be allowed for depreciation. Joint service from Sharon Heights to Canton Junction over the Blue Hill Street Railway was suggested at the hearing as a means of increasing the company's net revenues, but the commission questioned its advisability. There is little prospect of lower labor and material costs or increased revenue through growth in population of the company's territory. The gross income statement for the last three years showed an annual decline. The company needs an increase of about $7,300 in annual gross operating revenue, and it is estimated that the new rate will yield about $3,300.

In the recent Blue Hill fare investigation the commission intimated that it was doubtful whether the establishment of an 8-cent fare in that case would not have constituted an unjust discrimination against the short-haul riders, and approved an increase in the number of fare zones instead. The board pointed out that a rearrangement of fare zones is also likely to result in unfairness to passengers who are obliged to travel just across zone lines and thus introduce complications which it is sought to avoid. On account of the separation of the Norwood, Canton & Sharon Street Railway into two unrelated parts, it was impracticable to rearrange the fare zones.

Safety Work Brings Results

The safety organization of the Puget Sound Traction, Light & Power Company, Seattle, Wash., according to *The Electrogram*, its publication, regards safety first as not merely a motto but a slogan to be constantly applied in practice. It is a co-operative organization enlisting all officials and employees of the company and was formed in Seattle in 1912, at that time the first street railway organiation of the kind in the country. It is directed by a central committee and is divided into division safety committees representing the departments, as railway, power plant, steam plant, shops, electric transmission, etc. Meetings are held regularly in the carhouses where officials and men meet to discuss the different problems of safety work. A lecturer, who works in the public schools, has been maintained for six years and the results have been very encouraging. Accidents to children have been reduced from thirteen a month in 1912 to four a month in 1916.

The aim of the company is to reduce to a minimum the number of accidents that can be prevented by safety devices, rules and caution. The accompanying table gives the number of automobile and wagon accidents which involved street cars or occurred on streets near cars, and also the number of collisions with pedestrians which resulted in injuries for the years from 1912 to 1916. The automobile accidents are still on the increase, but the company places the burden of responsibility for these accidents upon automobile drivers since the cars cannot leave the tracks to avoid collisions.

TABLE SHOWING ANNUAL NUMBER OF ACCIDENTS INVOLVING DIFFERENT CLASSES OF TRAFFIC

Year	Automobile	Wagon	Pedestrian
1912	475	509	149
1913	702	533	135
1914	864	333	116
1915	1,554	235	89
1916	1,699	276	79

Business Stimulated by Rehabilitation

The Wisconsin Railway, Light & Power Company, La Crosse, Wis., began in June, 1916, to improve its property and service in order to encourage travel on its cars. Seven new forty-passenger pay-as-you-enter cars were purchased. Fifteen cars were remodeled for pay-as-you-enter operation and so far as possible were made to conform with the standard of the new cars in features such as folding doors and steps, lifeguards instead of projecting fenders, etc.

In December, 1916, through routing of lines was inaugurated which made it possible to reduce the number of lines from five to four, and to improve the schedule speed. A franchise arrangement is now before the local City Council, which will permit the further rearrangement of two lines and the reduction of the total number of lines to three. These will serve the city more efficiently and will provide for future growth through simple line extensions. Since this through routing has been established the number of transfers issued has been reduced more than 27,000 per month, and it is anticipated that the ultimate reduction will be more than 50 per cent.

The work of double-tracking four blocks on Main Street and six blocks on the south side line which is now in progress will, when completed, eliminate delays which now result from two lines operating over the same track. This will also make possible a five-minute headway for a distance of twenty blocks instead of a ten-minute headway as at present. The line voltage throughout the system has been raised also from 500 to 600 volts to increase the schedule speed. These various changes in service and equipment have materially effected economies and stimulated heavier riding.

Bus Line Established.—The Public Service Commission for the Second District of New York has granted a certificate of public convenience and necessity to Albert F. Warner for an auto-bus route between Watertown and Adams. No local passengers may be carried within the city of Watertown.

Fare Hearing Postponed.—The hearing before the Public Service Commission of New Hampshire on the petition of the Bay State Street Railway, Boston, Mass., for permission to increase its fares in Nashua, N. H., and to change the city fare limit in Hudson has been set for May 28 at Concord.

Dismissal of Fare Case Refused.—The Board of Public Utility Commissioners for New Jersey has denied a motion to dismiss the case of the city of Hoboken for a 3-cent fare on the Public Service Railway. The case has been pending for a long time now. Another hearing on the matter will be held in Jersey City on May 16.

Skip Stop Talked of in Washington.—The Capital Traction Company, Washington, D. C., is contemplating the adoption of skip-stop service for some cars during rush hours. A survey of the line has been made by representatives of two citizens' associations and the company. It is proposed to eliminate approximately one-third of the present stops.

Merchants Appreciate Electric Express.—The business men of Reading, Pa., are taking advantage of the freight service on the Reading Transit & Light Company, which was inaugurated about a year ago. The fast express service has proved to be a great convenience to shippers, and the business in Lancaster and vicinity has consequently increased to a marked degree.

Service Changes Planned for Cleveland.—The committee representing nineteen city organizations, which was appointed to suggest methods for eliminating traffic congestion in Cleveland, Ohio, has approved a plan and submitted it to officials of the Columbus Railway, Light & Power Company. According to the plan several lines would be rerouted and other routes would be changed so that cars on High Street would run a shorter distance than formerly.

Bay State to Reject Intoxicated Patrons.—The Bay State Street Railway, Boston, Mass., has promised the City Council its co-operation and support in keeping intoxicated persons from entering the city on its cars. A resolution to this effect, passed by the Council, has been posted in the carhouses of the company in Haverhill, Lawrence and Lowell. This movement is in line with similar actions taken by the Illinois Traction Company, Peoria, Ill., and the Philadelphia & West Chester Traction Company, Upper Darby, Pa., as noted recently in the ELECTRIC RAILWAY JOURNAL

Auburn-Syracuse Fares to Be Raised.—The Auburn & Syracuse Electric Railroad, Syracuse, N. Y., has announced that beginning May 28 a rate of 2 cents a mile will be charged between Auburn and Syracuse. This will make the fare 52 cents instead of 45 cents and the round-trip fare will be increased from 85 cents to $1. It is intended to leave some of the fares between intermediate points unchanged while others are to be slightly reduced. The proposed increase is said to have resulted from the general increase in expenses and the increase in wages recently granted to the company's employees.

Through Freight Rates Established.—C. B. Stafford, manager of the traffic department of the Board of Trade of Louisville, Ky., has announced that through freight rates on the electric railways connecting with the Louisville-Indianapolis lines at Indianapolis will soon be published by those systems. This matter in various phases has been before the Interstate Commerce Commission on several occasions. Certain difficulties have been met and the tariff will be made out soon. The new tariff will give rates by way of the electric lines from Louisville to stations in southern Michigan and in Illinois, Indiana and Ohio, north of Indianapolis.

Commission Acts on Freight Advance.—The Public Service Commission for the Second District of New York has permitted the railroads to file tariffs covering the proposed 15 per cent increase in freight rates in the same simplified form as the Interstate Commerce Commission has provided in interstate rates. This is a modification of the commission's rules to avoid expense and delay in the preparation of the elaborate rate schedules. The commission will in all probability take no action until the interstate rates have been settled. It does not approve of the new rates at this time and they are, as usual, subject to complaint, investigation and correction if in conflict with the State laws.

Texas Dealers Prefer Electric Express.—Testimony received by the Interstate Commerce Commission, in the rehearing of the Shreveport rate case at Dallas, Tex., disclosed the fact that jobbers and wholesale dealers of Dallas and other Texas towns reached by electric lines are shipping their freight by interurban express because the interurban express rates are considerably less than the rates by steam and because the interurban lines deliver shipments much more promptly than the steam lines. It was shown that the steam lines are operating under Fonda Tariff 2-B, while the interurban lines are employing the Texas Railroad Commission tariffs, which are considerably lower than the tariffs of the Fonda schedule.

Advance in Interurban Fares Proposed.—The Hagerstown & Frederick Railway, Frederick, Md., has filed with the Public Service Commission of that State a new tariff asking for an increase in interurban fares. The reasons given for the proposed advance are increased wages, higher prices for metal products and new equipment, and that the increase in transportation business is not sufficient to meet the increased operating expenses. Patrons had suggested that the usual summer service be furnished, which the company had intended to reduce, even at a slight advance in fares. It was decided to increase the interurban rates, which are now less than 2 cents per mile. The city fare of 5 cents and the commuter's rate will remain unchanged.

I. R. T. Traffic Record Shows Increase.—Figures just compiled by the Interborough Rapid Transit Company, New York, N. Y., show that during the month of April the subway carried 37,814,292 passengers, an increase of 3,662,514 or 10.7 per cent over the number carried in the same period last year. The elevated system carried 29,771,642 persons as compared with 27,942,079 for April, 1916, an increase of 1,829,563 or 6.5 per cent. These increases bring the total gain in passengers carried on the dual system during the last ten months of the fiscal year to 69,244,983. The total number of passengers carried in that period was 634,740,670. The total fares collected during last month amounted for the subway to $1,888,586 and for the elevated $1,487,549.

Disagreement on Smoking Privilege.—In response to a request by A. L. Valentine, superintendent of public utilities of Seattle, Wash., Hugh M. Caldwell, corporation counsel of that city, has issued an opinion stating that so far as the city is concerned passengers may smoke on street cars. Mr. Valentine had been requested to prohibit smoking on cars of the Puget Sound Traction, Light & Power Company running to and from the industrial plants. In a suit brought about two years ago by John M. Day, a prominent attorney, Judge Everett Smith of the Superior Court issued an injunction which prohibited anyone from holding a lighted cigar, cigarette or pipe inside a car. Mr. Caldwell recognized that injunction but said it was not the city's duty to enforce it. Mr. Day cited ordinances to show that this is the duty of the superintendent of public utilities.

Better Service on Pacific Northwest.—The Seattle-Everett interurban service of the Pacific Northwest Traction Company, Seattle, Wash., has been increased according to a new schedule effective May 1. Six limited trains daily in each direction are now operated, instead of the two as formerly, and a special late-train service has been instituted. On Saturdays and Sundays the number of limited trains is increased to nine. During seven years of operation, the road has run 110,000 trains, carrying a total of 5,000,000 passengers, without a single serious accident involving passengers, and not a passenger has been injured. Records in the dispatcher's office show that more than 99½ per cent of all the trains have left their terminals on time, and less than 4 per cent have arrived late. K. K. Carrick is general traffic agent, and Donald C. Barnes is local manager of the company.

Night Express to Reduce Expenses.—In a recent address to employees of the Toledo Railways & Light Company, Toledo, Ohio, one of the H. L. Doherty properties, Mr. Doherty said that freight hauling at night by electric railways would be a great revenue producer and would also serve to eliminate excessive handling of merchandise. The managers of the Doherty electric railway properties have been requested to investigate the plan thoroughly with a view of adopting it if possible. The hauling of products from the farms to the railroad and from the city terminal to the city buyer is done by inefficient methods which are expensive to the farmer and the consumer. Hauling freight at night on street cars would also eliminate congestion on city streets. Moreover, it has been pointed out that the plan would enable a city to extend its territorial limits without following steam railroads.

Seattle to Use More One-Man Cars.—The Puget Sound Traction, Light & Power Company, Seattle, Wash., has been authorized by the Public Service Commission of that State to operate more one-man cars on its lines in Seattle, and also to rebuild its old-style single-truck cars to conform with what is known as the "Type 142." Cars of this type are now in use on the Bellevue-Summit line of this company. The commission hastened its decision in order that the company could save the additional expense referred to in a notice which stated that on May 1 the cars would advance in price from 20 to 25 per cent. Seventy-five cars of this type will be required for use in Seattle. They have been in service in Spokane, Tacoma and Bellingham, and reports show that they give more general satisfaction on short runs than the heavier cars which operate at a lower schedule speed.

Electric Road Competes for Freight.—The largest volume of freight business in the history of the company is being handled by the Louisville & Interurban Railroad, Louisville, Ky. Steam roads with which the electric lines are in competition through the territory which they serve have been glad, apparently, to leave the local shipping to the latter while they take the long-haul traffic. R. H. Wyatt, general freight and passenger agent of the company, is making the most of the opportunity, which he regards as offering the electric service a long-wanted chance to demonstrate its capabilities. If satisfactory service is furnished at a time when the steam roads are giving unsatisfactory service, Mr. Wyatt believes that later on, when conditions return more nearly to normal, the electric lines will be able to retain much of their present business. In order to give the best service possible Mr. Wyatt hopes to work the freight equipment to its capacity. A contract was made recently with the Kosmos Portland Cement Company, which has a plant southwest of the city, to bring from four to seven cars a day to Louisville. The demand for cars is so great that it has been necessary to require the shipper to promise to unload the cars promptly. The company informs the consignee by telephone of the exact time when a shipment will be at its destination and urges that arrangements be made for immediate unloading.

Personal Mention

Valentine Burley is superintendent of transportation of the Binghamton (N. Y.) Railway, having succeeded William G. Decker, resigned.

A. S. Nichols, formerly local manager of Stone & Webster properties in Fort Madison, Wis., has been appointed to succeed W. L. Weston in a similar capacity in Paducah, Ky.

John W. McCardle, a former member of the Indiana Board of Tax Commissioners, has been named a member of the Public Service Commission of Indiana.

W. G. Murrin, whose promotion was reported recently, is now assistant general manager of the British Columbia Electric Railway, Vancouver, B. C. Mr. Murrin was formerly general superintendent.

A. B. Paterson has resigned as general manager of the Meridian Light & Railway Company, Meridian, Miss., operated by H. L. Doherty & Company, to become bond department representative of the Doherty interests in New Orleans and vicinity.

William J. Wood, a special examiner for the Interstate Commerce Commission, has been appointed to fill a vacancy on the Public Service Commission of Indiana. Mr. Wood was formerly a member and chairman of the Railroad Commission of that State.

H. E. Brandli, formerly general manager of the Citizens' Gas, Electric & Heating Company, Mount Vernon, Ill., succeeds A. B. Patterson as general manager of the Meridian Light & Railway Company, Meridian, Miss. The two companies are operated by H. L. Doherty & Company.

M. S. Sloan has been relieved of certain operating details in the management of the New Orleans Railway & Light Company, New Orleans, La., following the appointment of N. H. Brown as general superintendent of transportation. Mr. Sloan will continue as general manager of the company.

Bert Greenway has been appointed superintendent of the Grand Forks (N. D.) Street Railway to succeed W. J. Brekke, who has entered private business in Grand Forks. Mr. Greenway for the past four years has been general foreman and assistant superintendent of the Regina (Sask.) Municipal Railway.

Walter Alexander, chairman of the Wisconsin Railroad Commission until May 1, has accepted the position of superintendent of motive power of the Chicago, Milwaukee & St. Paul Railroad. Mr. Alexander was master mechanic of that road before his appointment as a member of the commission two years ago.

Carl H. Mote has succeeded Joseph L. Reiley as secretary of the Public Service Commission of Indiana. Mr. Mote was formerly engaged in newspaper and magazine work and is a past editor of the Indianapolis *Sun*. He has also had a wide experience as a statistician for public service corporations. He is the author of "Industrial Arbitration" and joint author of "Learning to Earn," a book on the subject of vocational education.

Ernest I. Lewis, a special correspondent for the Indianapolis *News*, has been appointed a member of the Public Service Commission of Indiana. Mr. Lewis has traveled extensively here and abroad, and as a result of his studies has collected much valuable information on public service problems. He assisted in organizing the Citizens' Gas Company, Indianapolis, and largely to his initiative are credited the present low rates for gas in Indianapolis.

P. D. Kline, who resigned on April 1 from the position of general manager of the Ogden, Logan & Idaho Railway, Ogden, Utah, has accepted the position of manager of the La Crosse district of the Wisconsin-Minnesota Light & Power Company. This property is operated by the American Public Utilities Company of Grand Rapids, Mich. A biographical sketch of Mr. Kline appeared in the ELECTRIC RAILWAY JOURNAL for March 31, page 620.

J. Vipond Davies, chief engineer of the Hudson & Manhattan Railroad, New York, N. Y., has been elected vice-president and a director of the company to succeed the late Richard W. Meirs. Mr. Davies is a native of South Wales and was graduated from Wesleyan College and the University of London. He is widely known as a member of the firm Jacobs & Davies, consulting engineers, New York, Montreal and London, with which he became connected in 1894. He is also consulting engineer for the Brooklyn (N. Y.) Rapid Transit Company. Mr. Davies has had a wide experience as a designing and construction engineer of both railroads and tunnels in different parts of the United States. His firm, Jacobs & Davies, designed and built the tunnels under the Hudson River, into New York, Jersey City and Hoboken, for the Hudson & Manhattan Railroad. In 1914 the Tilford gold medal was awarded him by the Institution of Civil Engineers, London, England, for his paper "Extensions of the Hudson River Tunnels of the Hudson & Manhattan Railroad."

J. V. DAVIES

W. L. Weston, operating manager of the Paducah (Ky.) Traction Company and the Paducah Light & Power Company, has been transferred to Fort Madison, Wis., as manager of the Stone & Webster properties in that city. Mr. Weston has been in public service work since 1906, when he became purchasing agent for the Northern Texas Traction Company, Fort Worth, Tex. He was later appointed assistant to the general superintendent of that company and in 1910 became general manager of the Tampa & Sulphur Springs Railway, Tampa, Fla. Mr. Weston has been local manager of the Paducah properties since 1912.

U. S. Sliter, who since 1914 has been superintendent of the efficiency department of the San Francisco-Oakland Terminal Railways, Oakland, Cal., has been appointed assistant superintendent of transportation. Mr. Sliter's duties during the last three years were confined partly to the building up of higher operating standards through the use of the coasting recorder, and in this work he has been very successful. He has also handled much of the work pertaining to jitneys and other transportation problems. Mr. Sliter went to Oakland in 1912, largely to reroute and reschedule the system. Previous to that time he served with the British Columbia Electric Railway, Vancouver, B. C., the Detroit (Mich.) United Railway and the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. With the last-named company Mr. Sliter spent eight years, part of the time as superintendent of transportation.

A. R. Whaley, vice-president of the New York, New Haven & Hartford Railroad, in charge of operating, engineering, construction and maintenance, will resign from active service with the company on May 31, to rest for a few months. Mr. Whaley is a native of Rhode Island, and has been in railway service since 1877, when he was employed as a freight brakeman on the Providence & Worcester Railroad. This road became a part of the New Haven system and Mr. Whaley, after serving in different positions, finally was made division superintendent, first of the Worcester division, and then in charge of operation, of the road from New York to New Haven, and the Harlem River and New Haven terminals. In 1907 Mr. Whaley became connected with the New York Central Railroad as general superintendent of its electric division and general manager of the New York terminal, with supervision over all trains of that company running into the city. He also had charge of certain details of the reconstruction of Grand Central Terminal. Mr. Whaley, through his long period of service, probably has a personal acquaintance with more New England railroad men than any other railroad official in the East.

Andrew E. Kalbach has been appointed receiver of the Second Avenue Railroad, New York, N. Y., to succeed the late John Beaver. He was formerly general manager and electrical engineer of the New York City Interborough Railway, now controlled by the Third Avenue Railway, of that city. Mr. Kalbach is a Naval Reserve officer, having been graduated from the Annapolis Naval School. He resigned from the navy in 1903 to become assistant engineer for the Rapid Transit Subway Construction Company, New York, and was afterward made general manager and engineer for the New York City Interborough Company, the majority of whose stock was then controlled by the Interborough Rapid Transit Company. In 1914 Mayor Mitchel of New York appointed Mr. Kalbach deputy commissioner of street cleaning of the Bronx.

O. R. Sturzinger, who has resigned as superintendent of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, began electric railway work at the age of twenty-three, when he was employed in the construction of the Sandusky, Milan & Norwalk Electric Railway. Upon its completion he served as conductor for six years, and was later made assistant general manager. In 1899 the Sandusky & Interurban Railway was under construction from Sandusky to Lorain and Norwalk, and Mr. Sturzinger became foreman of overhead construction for this road. These two properties were consolidated with the Lake Shore Electric Railway, Cleveland, Ohio, and Mr. Sturzinger remained with the company as assistant to the superintendent of motive power. In 1903 he became connected with the Toledo, Port Clinton & Lakeside Railway, which was then being constructed, and was appointed master mechanic. Four years later he was promoted to the position of general superintendent and was retained as superintendent with the company's successor, the Northwestern Ohio Railway & Power Company, until the present time. Mr. Sturzinger traveled abroad in 1913 and witnessed electric railway operation and visited power plants in several foreign countries. He intends to remain in electric railway service.

H. E. Vordermark, who has been elected vice-president and treasurer of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., as noted recently in the ELECTRIC RAILWAY JOURNAL, has spent virtually all of his business career in the local railway service in Fort Wayne. Soon after acquiring a high school education and a business training, he accepted a position as secretary to the general manager of the local company, then known as the Fort Wayne Electric Railway. In 1898 he was appointed auditor and retained this position when the company was consolidated with the Fort Wayne & Wabash Valley Traction Company. The Fort Wayne & Northern Indiana Traction Company later acquired this property and Mr. Vordermark was made auditor and secretary. He is still retained in the latter position. In the additional capacity of vice-president and treasurer he succeeds Henry C. Paul, who resigned in order to devote more time to other interests in Fort Wayne. Mr. Vordermark's duties as auditor are being assumed by his former assistant, Fred H. Schmidt.

H. E. VORDERMARK

Obituary

R. J. Jones, treasurer of the Tidewater Power Company, Wilmington, N. C., died at his home in that city on April 30 after a short illness. Mr. Jones was one of Wilmington's oldest and most prominent citizens. Until three weeks before his death he engaged actively in his duties in connection with the railway and other local interests with which he had been connected for a period covering nearly half a century.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Billings Railway, Light & Power Company, Billings, Mont.—Incorporated to take over the property of the Billings Traction Company and electrify the line and also possibly to construct an interurban line to Laurel. Capital stock, $300,000. It is planned to have electric cars in operation in Billings by Aug. 1.

***Catskill Mountain Railroad Corporation, Catskill, N. Y.**—Incorporated to construct a narrow-gage surface railway to be operated by steam, gasoline or electricity. Capital stock $100,000. Incorporators: E. E. Olcott, A. V. S. Olcott and G. H. Beach, Catskill.

FRANCHISES

Globe, Ariz.—The Globe-Miami Railway has received a franchise from the City Council to construct a line in Globe. The company proposes to build an electric railway from Globe to Miami. Edgar Sultan, Globe, secretary. [April 28, '17.]

Alameda, Cal.—The San Francisco-Oakland Terminal Railways has asked the City Council of Alameda for a resettlement franchise such as was recently voted by the citizens of Oakland.

Eagle Rock, Cal.—Bids will be received by the Board of Trustees of Eagle Rock until May 21 for a fifty-year franchise for an electric railway across Colorado Boulevard between Central Avenue and Rowland Avenue.

Rialto, Cal.—The Pacific Electric Railway has received a franchise from the City Council to operate an electric railway in Rialto.

Kansas City, Mo.—The Kansas City Railways has received franchises from the City Council to construct a double-track extension to the Twenty-seventh Street line from Chelsea to Denver Avenues and to double-track its line on Independence Avenue from Hardesty to Topping Avenues.

Bexley, Ohio.—The Ohio Electric Railway has received a franchise from the City Council to operate cars on East Main Street instead of in Mound Street, Bexley.

Windsor, Ont.—The Sandwich, Windsor & Amherstburg Railway has asked the City Councils of Sandwich, Windsor and Walkerville for an extension of its franchises to 1931.

Norfolk, Va.—The Virginia Railway & Power Company has abandoned its franchise in the Campostella section.

TRACK AND ROADWAY

Pacific Electric Railway, Los Angeles, Cal.—It is reported that the Pacific Electric Railway will construct an extension from Glendora to San Dimas.

***Wilmington, Del.**—James M. Satterfield, Dover, representing Lindes & Company, Franklin Bank Building, Philadelphia, has opened negotiations in the north part of Delaware for a trolley road which will extend from Wilmington to the lower boundary of the State, a distance of 90 miles. Such a road, if constructed, would parallel the Pennsylvania Railroad and would share in the freight and passenger traffic from this district. The consent of the Newcastle County authorities is being sought first and if that is obtained the company will be incorporated under the laws of the State of Delaware.

St. Petersburg & Gulf Railway, St. Petersburg, Fla.—Work will be begun at once by this company on the construction of a new bridge across Coffee Pot Bayou.

Springfield (Ill.) Consolidated Railway.—As a result of the State centennial plan to remove the tracks in Capitol Avenue, the Springfield Consolidated Railway has asked the Legislature for permission to extend its tracks from Second and Monroe Streets to Second and Charles Streets.

Tri-City Railway Davenport, Iowa.—The Council of the city of Moline, Ill., will ask the Tri-City Railway to lay its track on Fifth Avenue in the center of the thoroughfare. In resolutions adopted by the Council the recommendation is made that with the widening of Fifth Avenue the Tri-City Railway shall put in double tracks from Seventeenth Street to Fifteenth Street, and that there be four curves at the intersection of Fifth Avenue and Fifteenth Street and single track in the center of the widened avenue from Fifteenth to Thirteenth Street. Owing to the scarcity of steel rails of the kind desired, the resolutions included recommendations of the Shanghai type of rails.

Des Moines (Iowa) City Railway.—This company contemplates the reconstruction of its University line this summer.

Kentucky Traction & Terminal Company, Lexington, Ky.—An ordinance has been adopted by the City Council of Frankfort requiring the Kentucky Traction & Terminal Company to replace the wooden poles now in use on parts of Main and St. Clair Streets with ornamental steel poles.

Salem & Pennsgrove Traction Company, Salem, N. J.—Citizens of Quinton have petitioned the Salem & Pennsgrove Traction Company to extend its trolley line from Salem to Quinton. Rights-of-way have been donated for the 3 miles.

New York & Queens County Railway, New York, N. Y.—The Public Service Commission for the First District of New York, on motion of Commissioner Travis H. Whitney, has sent to the Board of Estimate and Apportionment a letter urging that body to consider favorably the construction of a temporary extension by the New York & Queens County Railway from its Flushing line at Jackson Avenue through Shell Road, Peartree Street and Roosevelt Avenue to the Alburtis Avenue station of the Corona rapid transit line. The proposed new extension will be approximately ¾ mile in length.

Schenectady (N. Y.) Railway.—A contract has been awarded by the Schenectady Railway to W. S. Rae, Pittsburgh, Pa., for the reconstruction of two 151-ft. spans of the Alplaus Bridge over the Mohawk River at about $50,000, to provide the necessary clearances over the channels of the barge canal. Traffic will be maintained while the work is in progress. Work has been begun by the company removing the State Street bridge over the Erie Canal and filling in the canal to make a practically level grade of the street over the old canal.

Black River Traction Company, Watertown, N. Y.—This company is considering the construction of an extension to the Maxim munition plant in Water Street.

Tulsa (Okla.) Street Railway.—Construction has been begun by the Tulsa Street Railway on an extension to West Tulsa. An agreement has been reached between the company and the County Commissioners for the use of the new Arkansas River bridge, the company to pay a rental of $150 a month. In crossing the bridge the company will use the common track with the Tulsa Traction Company.

Toronto, Barrie & Orillia Railway, Toronto, Ont.—The Ontario Legislature has refused to grant the application of the Toronto, Barrie & Orillia Railway for an amendment to its act of incorporation to extend the time within which the company's line was to be built. The company was originally incorporated in 1910 as the Monarch Railway, the title being changed in 1913. No construction work has been done. [Feb. 26, '16.]

Toronto (Ont.) Suburban Railway.—This company's extension from Lambton to Guelph, 48 miles, has recently been placed in operation.

Welland, Ont.—Surveys have been completed of the proposed line from Welland to Port Colborne to Bridgeburg, which is to be built by the Ontario Hydroelectric Commission at an approximate cost of $10,000,000.

Klamath Falls (Ore.) Municipal Railway.—The only bid received by the City Council of Klamath Falls for the construction of a municipal railway from Klamath Falls to Dairy, 20 miles, was that from Robert E. Strahorn at $300,-

000. Construction work will be begun within thirty days. [May 5, '17.]

Oregon Electric Railway, Portland, Ore.—This company plans to begin work shortly on the construction of a new draw span at the bridge across the Willamette River between Harrisburg and Junction City. Ten carloads of steel will be required in the construction of the span, which will be of the modern lift type and will permit the passage of the larger river boats should occasion demand it.

Southern Pacific Railway Company, Portland, Ore.—The plan of the Southern Pacific Company to discontinue street car service in Albany on April 30 has been postponed. Following the announcement of the company, a petition was circulated among business men of the city, asking the company to leave the cars in Albany and reconsider taking up the track. Business men have offered to co-operate with the company and assist in making the line pay.

Southern Pennsylvania Traction Company, Chester, Pa.—Contracts have been let by the Southern Pennsylvania Traction Company for the reconstruction of its line from Darby to Eddystone, 6 miles.

Reading Transit & Light Company, Reading, Pa.—Work has been begun by the Reading Transit & Light Company laying new tracks in Mount Penn from the eastern city line to Twenty-third Street. The work will be continued on Twenty-third Street to Friedensburg Road.

South Carolina Light, Power & Railways Company, Spartanburg, S. C.—This company will construct an extension to Whitney and will also reconstruct part of its Clifton line.

Cleburne (Tex.) Traction Company.—The City Council of Cleburne has authorized the removal of the physical property of the Cleburne Traction Company from the streets of Cleburne, and appointed W. W. Smith, J. W. Floore, Jr., and Murphy Pickle as an equalization board.

Dallas Northwestern Traction Company, Dallas, Tex.—Final surveys are being made for the right-of-way of the Dallas Northwestern Traction Company from Dallas to Slidell, via Denton. The first work will be done between Denton and Slidell and that part of the line will be placed in operation in a short time. The stockholders of the Standard Utilities Construction Company, which will build the line, have elected officers as follows: C. F. Hopkins, Tulsa, Okla., president; Ira E. Cornelius, Muskogee, Okla., secretary and treasurer; A. V. Demayo, New York, vice-president and general manager, and F. W. Hopkins, Jr., Springfield, Mo., assistant secretary and treasurer. [May 5, '17.]

Interstate Electric Corporation, San Angelo, Tex.—Plans are being made by the Interstate Electric Corporation to begin work within the next few weeks on its proposed system in San Angelo.

SHOPS AND BUILDINGS

Caldwell (Idaho) Traction Company.—It is reported that this company proposes the construction of a passenger station in Caldwell.

Fort Wayne & Northwestern Railway, Kendallville, Ind.—A new passenger and freight station will be built by the Fort Wayne & Northwestern Railway at Waterloo.

Waterville, Fairfield & Oakland Railway, Waterville, Me.—A new freight station will be built by this company at Waterville.

Ohio Electric Railway, Springfield, Ohio.—This company will construct a new passenger and freight station at Ottawa.

London & Port Stanley Railway, London, Ont.—It is reported that the London & Port Stanley Railway will erect a new building for offices and station purposes at Talbot Street, St. Thomas.

Reading Transit & Light Company, Reading, Pa.—This company will construct a large freight station to take the place of the present one at Penn and DeKalb Streets, Reading.

Virginia Railway & Power Company, Richmond, Va.—A contract has been awarded by this company to John T. Wilson Company, Richmond, for the erection of a storage warehouse. The structure will be 27 ft. x 40 ft., of concrete, and will cost about $5,300.

POWER HOUSES AND SUBSTATIONS

Kankakee (Ill.) Electric Railway.—A report from the Kankakee Electric Railway states that it has received a new 258-hp. boiler from the Erie City (Pa.) Iron Works, and will install same within the next thirty days.

Sioux City (Ia.) Service Company.—It is reported that the Sioux City Service Company contemplates the construction of a new power plant to cost about $750,000.

United Railways & Electric Company, Baltimore, Md.—This company has awarded a contract to the West Construction Company, Baltimore, Md., for the erection of a new substation, 60 ft. x 90 ft., at Sollers Point.

New York Municipal Railway Corporation, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has approved an award by the New York Municipal Railway Corporation to A. Pasquini, New York City, of a contract for the new Ridgewood substation to be used in connection with the furnishing of current for the operation of the Fourteenth Street-Eastern line and other new rapid-transit lines in Brooklyn. The contract price is $59,990. The original low bidder was William Flanagan when bids were received by the Brooklyn company on April 9. Later Mr. Flanagan withdrew his offer and the company prevailed upon Mr. Pasquini, who had made a bid of $64,080 for the work, to withdraw that bid and accept a contract at the figure at which Mr. Flanagan's bid had been made.

Oklahoma City, Okla.—E. P. Truett of New York and Wardis Arnold of Chicago have arrived at Ada, Okla., to begin work on a large electric power plant to be built on the Canadian River near Shawnee. The plant will cost $500,000 and will supply electric current for several interurban lines out of Oklahoma City and other towns, and will also supply current for lighting and power to the cities of Shawnee, Ada and Oklahoma City.

Harrisburg (Pa.) Railways.—A report from the Harrisburg Railways states that during the next month the company will place a contract for one 500-volt rotary transformer. The company has ordered coal and ash conveying apparatus to be installed in its plant.

Reading Transit & Light Company, Reading, Pa.—Plans are being made by the Reading Transit & Light Company and the Metropolitan Electric Company to install underground wires in the existing conduit system in the business section of the city, including connections, etc., at a cost of approximately $1,000,000.

Rutland Railway, Light & Power Company, Rutland, Vt.—Work has been begun by this company on the erection of a new transmission line from the Rutland substation to Mendon and from Rutland to West Rutland. This line will be operated temporarily at 13,000 volts, but has been insulated for 44,000 volts, which will later be used. A transmission line from West Rutland to Castleton, about 12 miles, has been authorized. Material has been ordered and work will soon be begun.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—It is reported that this company will begin work immediately on the erection of a 25,000-volt transmission line from Fern Hill to Olympia to connect with the service lines of the Olympia Light & Power Company. The cost is estimated at $53,000.

Appalachian Power Company, Bluefield, W. Va.—This company plans to construct a $1,000,000 steam-driven electric generating station on the New River, between the Virginian and Norfolk & Western Railways. The equipment will include an 18,750-kw. turbine, three 1200-hp. boilers, etc. The plant may furnish electricity for the proposed Virginian Railway electrification at Clarks Gap and for the proposed extension of the Norfolk & Western Railway electrification east of Bluefield. An 18,750-kw. turbine and boilers have been purchased for the plant, but other details may not be decided upon for some months.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Reducing the Selling Cost

Office Hours for Salesmen a Help—Are Postcard Lists Effective?—Salesmen Make Too Many Trips

BY E. C. JOHNSTON

Purchasing Agent East St. Louis & Suburban Railway, East St. Louis, Ill.

I have read with interest the article by L. W. Horne in the ELECTRIC RAILWAY JOURNAL of April 14, and while I agree with his ideas in some respects, I have found that all his suggestions do not always work out.

The selling expense of an article is often a very large item. I realize also that we pay our proportion of this expense whether it costs the manufacturer anything additional in order to sell us a particular item, or not. The manufacturer's article is priced on a basis of manufacturing plus certain selling expense, which is averaged. Of this I may pay my average share without causing any actual expense, while the other purchaser pays the same share and demands continual solicitation.

If Mr. Horne could devise some means that would enable the buyer to have a knowledge of all articles for sale or that would enable the salesmen to know just when to call on the buyer, it might prove a help; but to my mind it is foolish to assume that any arrangement could be made whereby the salesman of each and every article could be repaid for his time and expense by receiving an order when he calls. The proper method is to anticipate one's wants in such quantities that it will not be necessary to demand impossible deliveries. This, in turn, will give the purchasing agent the necessary time to investigate competitive articles.

POSTCARD LISTS FAIL TO BRING RESULTS

In regard to the suggestion that a manufacturing company should send out postcards listing a number of items which it handles, I do not believe that such a method of soliciting orders would be very successful. I judge from my own case. I pay absolutely no attention to such notices unless I am particularly interested in some special item, but my case is probably different from that of some of the men on smaller railways. Our purchasing department has direct authority over the stores department, and it has been our aim in the past to maintain a supply of all staple stock used by our various departments. Usually we have quantities sufficient to cover a period of from three to four months. I will admit, however, that due to the present condition of markets and factories, we are not always able to carry this amount of surplus stock. I do not think it possible to have a stock or supply room managed by any other officer than the purchasing agent, as I have never yet found an operating head of any department who could or who would anticipate his wants on each and every article used by his department. Some roads have the storeroom under the jurisdiction of the master mechanic, which to my mind is wrong, as the master mechanic is interested in a single line of materials and is not always familiar with market and delivery conditions.

Mr. Horne says it is usually found that the more times a salesman calls on a buyer the better success he has. This may hold good in some cases, but I do not believe it would cover the majority. The truth of the matter is, the more trips a salesman makes to this office without some excuse for his presence, the less successful he will be. Such a salesman is not only wasting his employer's time and money, but mine. I would much prefer, in 99 per cent of the cases covering salesmen's calls to my office, to be allowed the privilege of inviting these calls rather than having the salesmen periodically drop in.

I am thoroughly in accord with one of Mr. Horne's remarks, that there are too many supply men personally soliciting business. I don't mean by this that I do not want competition, because I believe that is up to the purchasing agent himself to demand if he so wishes. So far as a salesman making three or four calls in order to close a comparatively small order is concerned, I believe that is the salesman's fault.

Mr. Horne further states that if the railway men would take a definite "yes" or "no" attitude it would save time and money for the supply men. The average supply man resents anyone taking this attitude unless, of course, it is "yes." It cannot be yes in all cases.

"NO" ATTITUDE SAVES THE SALESMAN'S TIME

I believe the majority of the purchasing agents refrain from using the "no" attitude in order to save the salesmen from making additional trips to know why. I have found, in quite a number of cases where I took this attitude, that it took me longer and the salesman called oftener and caused more expense to his employer than if I had let the order take its course and the "no" be found out later. Of course, Mr. Horne's viewpoint is opposite to mine in several cases, because he is the seller and I am the buyer.

I have established office hours for sales representatives in order to be able to do something in addition to entertaining, and I have found this quite profitable. There are times, of course, that we do not follow this rule strictly. For instance, when a man from out of the city calls, I always give him an interview.

Truck Deliveries Put at Six Months

Reasons Given for Two to Three Months' Longer Delivery if Special Products Are Demanded

"Our customers are not expecting deliveries of trucks, except in emergencies, earlier than six months." This statement recently made by the sales manager of one of the large truck builders expresses in a nutshell the delivery situation as it exists to-day. In response to an inquiry from the purchasing department of a large operating property several truck builders recently were questioned on the delivery situation for their standard and for special types of trucks. The views of the manufacturers, which practically coincide, are expressed by the following statement: "It is necessary in these days to make a special ruling to suit each case as it comes up. We try to ascertain the conditions and wishes of our prospective customers and meet these as nearly as possible." This, in fact, is the spirit which has pervaded the electric railway industry during the war period. From all accounts this spirit prevails in this industry more than in almost any other. Sacrifices, uncalled for by strict business rules, have been made by both buyers and sellers when it has been found that a much-needed favor could be rendered. And above all, the involved relations, so far as purchasing is concerned, have plainly been seen in the need for forehandedness in buying and adherence to standards.

AS ONE MAN VIEWS AN ORDER

The car and truck builders urge standardization as much in the interest of the purchaser as in their own interest. One manufacturer has the following comment to make apropos of the present delivery situation: "I wouldn't attempt to quote anybody a price unless I knew definitely what he was seeking. It is the rarest exception for us to get an inquiry on any type of cataloged truck, because almost invariably something special is required in the way of wheels, axles, journal boxes, bearings or some other important part. And these items themselves usually are the limiting features for delivery. For example, a great many people want heat-treated axles and these are not obtainable in less than eight to ten months. Rolled steel wheels are hardly obtainable during the present year, except by accident, and I wouldn't want to offer or suggest off-hand as to when roller center or side bearings could be obtained."

STANDARDS SPEED DELIVERY

Just how much standards aid in making deliveries is plainly to be noted by one truck maker, who writes as follows regarding his production and delivery situation: "If standardized trucks of either city or interurban types, are ordered, and complete information is given us, we can make delivery in four months. As a matter of fact, however, it usually takes one month for completing the data. As the gears are liable to hold up delivery another month, the actual delivery period is about six months."

In discussing deliveries another manufacturer puts the saving at sixty to ninety days for a standard over a special truck. The reasonableness of the difference in delivery is easily seen and appreciated: "Standard designs, if used, not only reduce the work in the drafting room, but permit the use of present patterns and dies. They also avoid those troublesome shop-routine delays due to sidetracking of non-standard parts in a big busy shop."

Most of the slow truck deliveries of the last year have cost the truck builders more than their normal profits. The builders would have saved this if it had been humanly possible.

Contactor Signal Sales Analyzed

BY CARL P. NACHOD

President Nachod Signal Company, Louisville, Ky.

The refining process which trolley contactor control for automatic block signals has been undergoing during the last few years has greatly increased the field of usefulness and broadened the sales of this type of apparatus. It is now successfully used not only on single-track lines for both absolute and permissive signaling, but also on double-track lines for rear-end protection, and this at comparatively high speeds.

Contactor control has been applied to highway crossing bells for voltages as high as 1500 volts direct current, and it is well adapted for other uses, such as annunciators, headway recorders and for controlling station lights, etc. Our company brought out last year the first direct 1500-volt direct-current trolley contactor signals on the market. These are two-position absolute signals for single track and are provided with a preliminary at one end.

THE SALES ANALYZED

In an analysis of our business of the past year we find about 5 per cent of our sales were for double-track, rear-protection signaling, these being of the three-indication type and giving information two blocks in advance, some operating at train speeds of 50 m.p.h. with blocks averaging 0.4 mile long.

The type-CD signals are the most popular of our single-track signals, constituting 73 per cent of our total sales. These require two line wires and permit the utmost flexibility of car movements. About 10 per cent of our sales were the single-wire type-C signals—the original Nachod car-counting signal. The latter type does not permit as varied shifting movements as the type CD. About 10 per cent of our sales were of our type-MD signals. These have normally closed, hold-clear circuits and give a consecutive "answer back" or indication to the motorman.

Business in highway crossing signals has not yet attained the volume that we expect, but we are now furnishing various aspects, such as flashing lights and wigwags in combination with bells.

Our automatic headway recorder has been installed in many cities during the past year and the railway managements evidently think it of much value for checking schedules and locating service irregularities.

We were favored with an exceptional amount of business last year, and this year so far has been nearly equal to it. We feel the difficulty of obtaining material, even at the greatly increased prices now prevalent, but our policy has been to keep prices as low as possible.

Woes of the Malleable Iron Users

Line Material Manufacturers Greatly Hampered by Long and Uncertain Delivery Situation in Malleable Iron Industry

With some overhead line material manufacturers the malleable casting situation is now the most important factor so far as deliveries are concerned. The high prices which the manufacturers are offering to the foundries, although large compared with anything paid in earlier years, seem to be of no avail in obtaining work promptly. The foundries are filled beyond capacity, and since the overhead line material castings are of a higher quality than the ordinary run of malleables, the line material manufacturers are forced to pay an extra premium for quality work and also are confronted with exceptionally slow deliveries.

TEN MONTH MALLEABLE DELIVERIES

To quote one sales manager: "The best delivery, as near as we are able to determine, promised to-day by any malleable iron foundry on such castings as are used in making up finished line material, and particularly molded trolley line material, is from eight to ten months. Therefore, unless the line material manufacturer has already placed his orders with the foundry, he now finds it necessary to wait that length of time before he can obtain his castings for any particularly large order. For example: If he had placed orders four months ago for the necessary castings to be used in making up trolley material, these castings would in all probability not be shipped until the end of the next four or five months."

Another manufacturer, referring to line material requirements, has stated that his company is in a position to make shipments on bronze fittings within a week or ten days from the receipt of the order, and on 75 per cent of the malleable fittings he can now make delivery direct from the storeroom, but on the other 25 per cent of his list of standard articles, delivery must be delayed anywhere from three to six months. These articles are such, however, that if urgently needed bronze castings can be substituted for the malleable castings. This situation refers particularly to overhead switches and crossings. This manufacturer also states that on special overhead materials not regularly listed it takes from four to eight weeks to execute the orders; that is, assuming that the production of the device has to go through the consulting, blueprint and pattern stages, as well as through the shop. On a large construction order, if the fittings were standard, this manager reports that his company could make fairly regular weekly shipments after a start of about three weeks, *i. e.*, he could supply enough material to keep several line gangs busy.

The purchasing agent will appreciate the manufacturer's situation when it is stated that the average time of delivery on new malleable orders now approaches a full year, and this does not contemplate any special work, but just the regular run of patterns. The quality requirements are partly responsible for the long delivery. During the past year several overhead line material manufacturers have placed their malleable patterns with a number of foundries which undertook for the first time to make the high-quality castings required. The results were not satisfactory, and now those foundries which have had experience with overhead line material patterns assert their inability to make satisfactory line material malleable castings for less than 5 cents a pound increase over the regular run of malleable castings of the same weight. Thus the restricted number of plants from which the line material manufacturers may order high-grade malleables has had much to do with hampering the line material producers in making deliveries.

With pig iron approaching $50 a ton and asbestos, which is the largest ingredient in molded insulation, increasing from $30 to $80 a ton, it would seem difficult now for the line material manufacturers to make definite plans for the future, other than to urge purchasers to announce as early as possible any business which they intend to place.

Bound Catalog Finds Favor

Company Changes From Loose-Leaf to Bound Catalog—Recent Discussions on Standardizing Catalogs Effective

By JAMES H. DREW

President Drew Manufacturing Company, Indianapolis, Ind.

This company began recently the compilation of a new catalog in the old standard bound-form style of the usual size. Since this discussion regarding a standard form of catalog has arisen, we have gone into the subject seriously, and are convinced that an 8½ in. x 11 in. size is the most practical to use. However, from past experience with our catalog in the hands of our customers and with the catalogs of people from whom we buy, in our hands, we know that a loose-leaf catalog is never kept up to date, and there are always either omissions of supplements or vague doubts as to whether the information contained in the catalog is down to the minute.

We have, therefore, changed our plans and will shortly issue a line material and railway specialties catalog in bound form 8½ in. x 11 in. in size. This will permit its being kept in vertical files, and if letter size circulars of special information or additional data are sent out referring to this catalog they can be filed in the catalog itself in the same manner that any other correspondence is filed. We believe this plan will be more convenient for purchasing agents and engineers. It will make the catalog readily accessible, and if any correspondence or bulletins relative to the matter contained therein are sent out, the greatest possibility of their being filed in the proper place will be obtained.

We have also discovered that illustrations, descriptive matter and list prices can be utilized to a greater advantage and at less expense than in the usual volume size of book. Another advantage is that an 8½ in. x 11 in. catalog, unless extremely bulky, will always remain flat when open.

Car Shortage Increases

According to the monthly statement of the American Railway Association, the net freight car shortage on April 1 was 143,059, the highest figure that has been reached in recent years. Since August, 1916, when there was a surplus of 9762 cars, the shortage has steadily increased, with the exception of the Jan. 1 report, which showed a reduction in the shortage amounting to 7130, bringing the shortage down to 62,247 on the first of the year. Railway officials continued to attribute the shortage to the abnormal amount of business and to the congestion in the East, due to lack of terminal facilities and of ocean tonnage to carry the freight away after it has arrived at the Atlantic seaboard.

There are about 2,300,000 freight cars in service in the United States. Thus a shortage of 143,059 cars represents over 6 per cent. In the fiscal year ended June 30, 1916, 2,336,291,000 tons of freight were carried on the railroads of the country, each ton being carried an average distance of 178 miles. The loss to the railroads through the car shortage will be appreciated when it is considered that the average amount received for transporting 1 ton of freight 1 mile in the year ended June 30, 1916, was 0.707 cent.

Ball Bearing Companies Merged

The S K F Administrative Company, 1 Wall Street, New York City, announces that hereafter it will direct the affairs of the S K F Ball Bearing Company and of the Hess-Bright Manufacturing Company. The board of directors of this company, which was recently incorporated in New York, consists of Frank A. Vanderlip, president of the National City Bank; Thatcher Brown of Brown Brothers; F. B. Kirkbride, S. Wingquist, Axel Carlander, Marcus Wallenberg, and B. G. Prytz, who was formerly president of the S K F Company, and who now will be the president of the new company. Budd D. Gray, formerly president of the Hess-Bright Company, will become technical adviser to the new company, which will thus have the benefit of his experience in its various interests. The new company is extending the manufacturing facilities of both the Philadelphia and Hartford plants, in order to meet the demand for the company's products.

NEW YORK METAL MARKET PRICES

	March 31	May 10
Prime Lake, cents per lb.	35	31
Electrolytic, cents per lb.	35½	31
Copper wire base, cents per lb.	42	36
Lead, cents per lb.	9½	10⅝
Nickel, ingot, cents per lb.	50	50
Spelter, cents per lb.	10¾	9⅝
Tin, Straits, cents per lb.	55⅞	59⅜
Aluminum, 98 to 99 per cent, cents per lb.	55	60

OLD METAL PRICES

	March 31	May 10
Heavy copper, cents per lb.	29	25
Light copper, cents per lb.	24¾	22
Red brass, cents per lb.	20	18½
Yellow brass, cents per lb.	19	17½
Lead, heavy, cents per lb.	8	8
Zinc, cents per lb.	8	7
Steel car axles, Chicago, per net ton	$38	$41.50
Iron car wheels, Chicago, per gross ton	$22	$24.25
Steel rail (scrap), Chicago, per gross ton	$27.50	$31.50
Steel rail (relaying), Chicago, per gross ton	$34	$39
Machine shop turnings, Chicago, per net ton	$9.50	$11.00

CURRENT PRICES FOR MATERIALS

	March 31	May 10
Rubber-covered wire base, New York, cents per lb.	42	36½
No. 0000 feeder cable (bare), New York, cents per lb.	42	36½
No. 0000 feeder cable stranded, New York, cents per lb.	39¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	39½	33
No. 6 copper wire (bare), New York, cents per lb.	42	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton	$38	$38
Wire nails, Pittsburgh, per 100 lb.	$3.20	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.65	$3.85
Steel bars, Pittsburgh, per 100 lb.	$3.75	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$4.85	$6.35
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$6.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	4.05	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.85	4.15
Cement (carload lots), New York, per bbl.	$2.02	$2.12
Cement (carload lots), Chicago, per bbl.	$2.06	$2.16
Cement (carload lots), Seattle, per bbl.	$2.60	$2.50
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.11	$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.02	$1.22
White lead (100 lb. keg), New York, cents per lb.	10¼	11¼
Turpentine (bbl. lots), New York, cents per gal.	45	50

ROLLING STOCK

Indianapolis & Louisville Traction Railway, Scottsburg, Ind., is in the market for one trailer box car and two flat cars.

Hutchinson (Kan.) Interurban Railway Company is remodeling and rebuilding a number of cars which will later be adapted for one-man operation. All cars remodeled will be equipped with National Pneumatic Company's door and step mechanism, Westinghouse 12-A motor equipments and Taylor electric trailer trucks.

El Paso (Tex.) Electric Railway has specified the following details of equipment for the ten double-end pay-as-you-enter safety motor cars which are now being built for this company by the American Car Company, St. Louis, Mo.:

Seating capacity	34
Length over bumpers	27 ft. 9½ in.
Length over vestibule	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Rail to trolley base	12 ft. 6 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	None, rafter finish
Roof	Arch
Air brakes	Safety Car Devices Company
Axles	Brill
Bumpers	American Car, channel iron
Car trimmings	Brill
Couplers	None, pull bars used
Curtain material	Pantasote
Door mechanism	Safety Car Devices Co.—air operated
Hand brakes	American Car, with Pittsburg ratchet drop handle
Designation signs	Hunter
Headlights	Golden Glow, S-M-95
Journal boxes	Brill
Motors	Two inside hung, make not specified
Sanders	Keystone air sanders
Sash fixtures	O. M. Edwards
Seats	Heywood Bros. & Wakefield
Seating material	Mahogany, wood, steel and canvas lined rattan
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trucks	Brill 78-M-1 special
Ventilators	Utility Ventilator Company
Wheels	24-in. diam, 2½ in. tread, ⅝ in. flange
Special devices	Faraday high voltage push button system

Union Light & Power Company, Fargo, N. D., expects to purchase fifteen new steel cars. They will be one-man pay-as-you-enter cars and will cost approximately $75,000.

Houston (Tex.) Electric Company is having eighteen single-end pay-as-you-enter one-man safety cars built in St. Louis by the American Car Company. These cars will be equipped with Safety Car Devices Company's air brakes and safety control equipment.

United Railways & Electric Company, Baltimore, Md., will soon place an order for eighty semi-convertible double-truck pay-as-you-enter cars similar to the 100 cars recently purchased from The J. G. Brill Company. It is said the new cars will be of greater capacity than the ones in use at present on the lines of this company.

Seattle (Wash.) Electric Company, noted in the April 21 issue as being one of the companies for which Stone & Webster, Boston, Mass., ordered 119 cars from the American Car Company, has specified the following details for the twenty-five pay-as-you-enter one-man safety cars:

Number of cars ordered	25
Type	One-man safety cars
Seating capacity	36
Length over bumpers,	27 ft. 9½ in.
Length over vestibule,	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Height, rail to trolley base,	12 ft. 6 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	None, rafter finish
Roof	Arch
Air brakes,	Safety Car Device Company's
Axles	Brill
Bumpers,	American Car—Channel iron
Car trimmings	Brill
Couplers	None, pull bars used
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism,	Safety Car Device Company's air operated
Hand brakes,	American Car with Pittsburg ratchet drop handle
Headlights	Golden Glow
Journal boxes	Brill
Sanders	Keystone air sanders
Sash fixtures	O. M. Edwards
Seats, style,	Heywood Bros. & Wakefield
Seating material	Mahogany wood, steel and canvas lined rattan
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trucks, type	Brill 78-M-1
Ventilators	Utility Ventilator
Wheels,	24 in. Diam. x 2½ in. tread x ⅝ in. flange
Special devices,	Faraday high-voltage push button system

TRADE NOTES

Western Electric Company, Trenton, N. J., has filed notice of an increase in its capital from $15,750,000 to $30,750,000.

Okonite Company, New York, N. Y., has moved its offices to the seventh floor of the Astor Trust Building, 501 Fifth Avenue.

MacBeth-Evans Glass Company, Pittsburgh, Pa., announces that its general offices are to be in the new Chamber of Commerce Building, and will occupy the fourteenth floor.

Hyatt Roller Bearing Company, Newark, N. J., announces that due to advances in its costs of raw materials ranging from 10 to 50 per cent. it has been found necessary to increase its prices, effective May 15.

Tuco Products Corporation, New York, N. Y., has been incorporated for $500,000. The company, which was organized by Henry G. Wenzel, William H. O'Neill and James Carty, will manufacture railway cars.

Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio, announces that Guy Robert Ramsey, associate member, A. S. C. E. of Orlando, Fla., has joined the engineering staff of this company and will be division engineer for the Southern States, with headquarters at Atlanta, Ga.

Copeland-Inglis Shale Brick Company, Birmingham, Ala., of which Beattie A. Inglis is vice-president and treasurer and W. Lawton Inglis is secretary, has become a licensee of the Dunn Wire-Cut Lug Brick Company of Conneaut, Ohio, and will henceforth make wire-cut lug paving brick.

John C. Dolph Company, Newark, N. J., manufacturer of insulating and protective varnishes, announces the completion of additions to its plant which will double its capacity. These additions include new executive offices and a new enlarged insulating laboratory.

S K F Ball Bearing Company of California, Inc., San Francisco, Cal., has been organized in order to supply more readily the rapidly increasing demand for S K F ball bearings on the Pacific Coast. The main office of this company, under the direction of A. M. MacLaren, has opened in San Francisco at 341 Larkin Street, and at this office a large and assorted stock of bearings will be carried.

General Electric's New Sales Manager

As was announced in last week's issue of the Electric Railway Journal, John G. Barry has been appointed general sales manager of the General Electric Company. This appointment commends itself to his large circle of friends in the electric railway industry as most fitting and well deserved. Mr. Barry is a man who does things. He gets results. His forceful personality is an integral part of that industry. It is a pleasure to learn that he will continue his managership of the railway department along with the more general responsibilities of his new position.

JOHN G. BARRY

Men of Mr. Barry's type deserve to succeed, because they put first things first, "plug hard" at their work, and at the same time realize that good-fellowship is not inconsistent with hard work. Of course, these characteristics did not in themselves insure Mr. Barry's promotion, but they are cited as indications of the strong personality behind them. Promotion came in this case, as it does in others, because he was the best-fitted man available for the higher job, that's all. His consistent record of progress should be inspiring to all ambitious young men, especially those in the electric railway business field. Here it is: After a high school course, entered employ Thomson-Houston Company, Lynn, Mass., in production department; transferred to commercial department, Boston office; in 1894, two years after combination of company with Edison General Electric Company to form General Electric, transferred to Schenectady, soon thereafter being made assistant manager railway department and manager in 1907; promoted to be sales manager, May, 1917, at the age of 47.

Besides being useful to the General Electric Company, Mr. Barry takes a prominent part in the civic activities of Schenectady. He is a director of the Schenectady Trust Company, served on the school board for several years, and lives up to the duties of a good citizen in every possible way. In his business affairs he is frank in stating what he wants and why he wants it, but is considerate of the wishes of others. He has the knack of doing things expeditiously without sacrifice of accuracy. Everybody trusts him, everybody likes him. The Electric Railway Journal extends to him on behalf of the industry the best wishes of all for his continued and increasing success.

ADVERTISING LITERATURE

Van Dorn & Dutton Company, Cleveland, Ohio, has issued a bulletin illustrating its different types of gears.

National Lead Company, New York, N. Y., is distributing a booklet "Red Lead and How to Use It," by Prof. A. H. Sabin.

American Electrical Works, Philipsdale, R. I., has issued a bulletin announcing charges for reels and spools which indicate higher prices on several sizes made necessary by advances in the cost of raw materials and of manufacture.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued leaflet 3976 illustrating its outdoor metering equipments. These are adapted for use on transmission lines where the expense of a substation is not warranted.

Ohio Brass Company, Mansfield, Ohio, is distributing an attractive bulletin on its gas-weld rail bonding process. Applications of this type of bonding in paved streets, on open track and on the elevated are described and illustrated, showing that this process is suitable to all conditions. The method of testing rail bonds by the use of two millivoltmeters to determine the number of feet of rail equivalent to 1 ft. of joint is explained.

Bewitched Milk

When Irish cows get lean and scraggy, and their milk turns blue and creamless, the peasant is convinced that some witch is getting to the cows first, leaving the unprofitable dregs to him.

When a railway has been yielding good rich milk and the net profit or cream disappears, the management may well look for causes of bewitchment.

Of all the witches who prey on net earnings, none can be eradicated more easily than "Poor Braking."

Do your eradicating with the **Peacock Brake** and thereby restore the cream to your net earnings.

The Eccentric Drum

National Brake Co.
Buffalo, N. Y.

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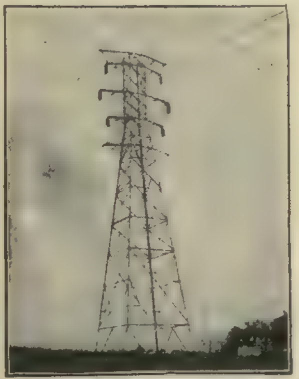
HUDSON TERMINAL-30 CHURCH STREET, NEW YORK

Manufacturers of Steel Structures of all classes particularly BRIDGES AND BUILDINGS



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U. S. Steel Products Co. Pacific Coast Dept.
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EMB Grid Resistors

ARE MADE RIGHT AND STAY RIGHT

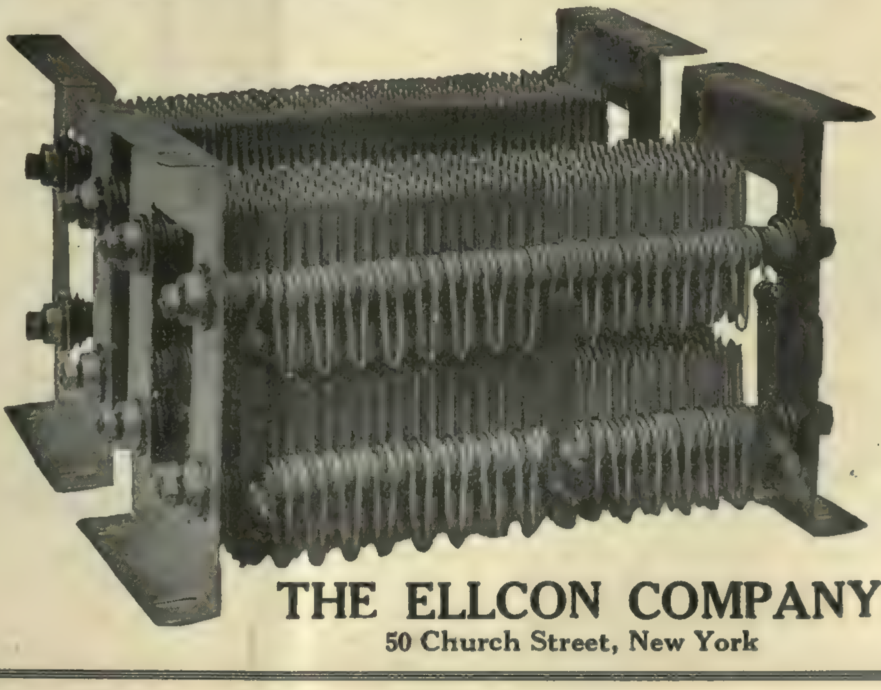
No resistors get more abuse than those under a car.

They are abused electrically by careless operation of the controller.

They are abused mechanically by exposure to dusty, muddy and stone-littered streets.

Until the arrival of E M B drawn, non-corroding grid resistors, troubles from these sources seemed unavoidable.

E M B grid resistors actually have made this part of your equipment troubleproof.



THE ELLCON COMPANY
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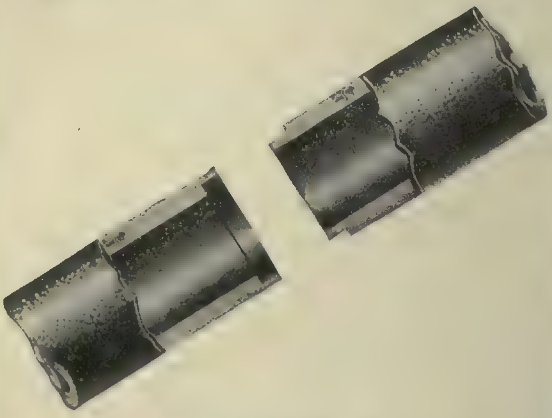
Johns-Manville
FIBRE CONDUIT



After 200 hours immersion in water we submitted J-M Fibre Conduit to a puncture test

The Johns-Manville Fibre Conduit selected for this test, with a ¼-inch thick wall, was actually *submerged in water* for 200 *hours* before applying puncture test.

And it took 24,000 volts to puncture its quarter-inch wall.

This is proof of a substantial sort that Johns-Manville Fibre Conduit means continuity of service even when thousands of volts inside are trying to get to ground, and water on the outside is trying to get in.

Johns-Manville Fibre Conduit is impervious to moisture not only in the continuous sections but at the joints, too. It is watertight.

Johns-Manville Fibre Conduit costs little to lay, breakage is practically nil and it gives superior results in service.

Write for prices.

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Serves more people in more ways than any other institution of its kind in the world.

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That Goes Furthest

Three meanings to that.

Goes furthest because it wears longest—hence greater mileage per bearing.

Goes furthest because it's of the lightest bulk—hence more mileage per pound.

Goes furthest because it can be used over and over again—hence still more mileage per dollar.

That's the value represented in

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The physical properties of MORE-JONES ARMATURE BABBITT METAL are only partially dependent on the formula. A duplicate of our analysis would not necessarily mean the same service. The process of manufacture enters into it, as also the quality of the metal.

MORE-JONES ARMATURE BABBITT METAL is made only of pure, new material—no scrap, no lead—perfectly amalgamated and of a uniform composition. Specially developed to resist the strains, vibration and heat temperatures of Armature Bearing service. On every count this is the Babbitt you should use.

MORE-JONES
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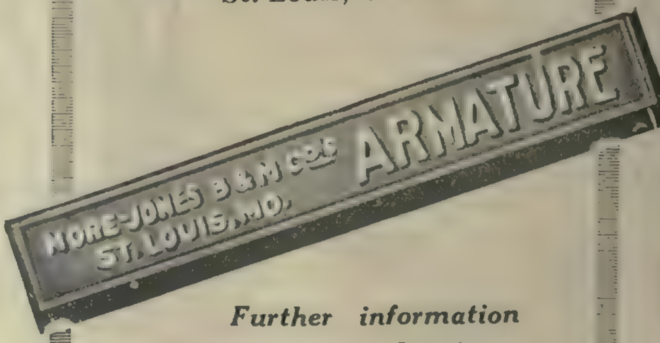

Further information and prices on application

Steel for Service

Steel Cross Ties

In making up your cross tie renewal program, have you considered the **advantage of substituting steel** for wood ties?

If not, we believe we can submit some **facts** that will be **interesting** to **you.**

In many instances we can show that the use of **steel ties** will **effect a saving of money.**

Our representative will be glad to confer with you and submit complete data.

The mark of quality CARNEGIE It protects the user

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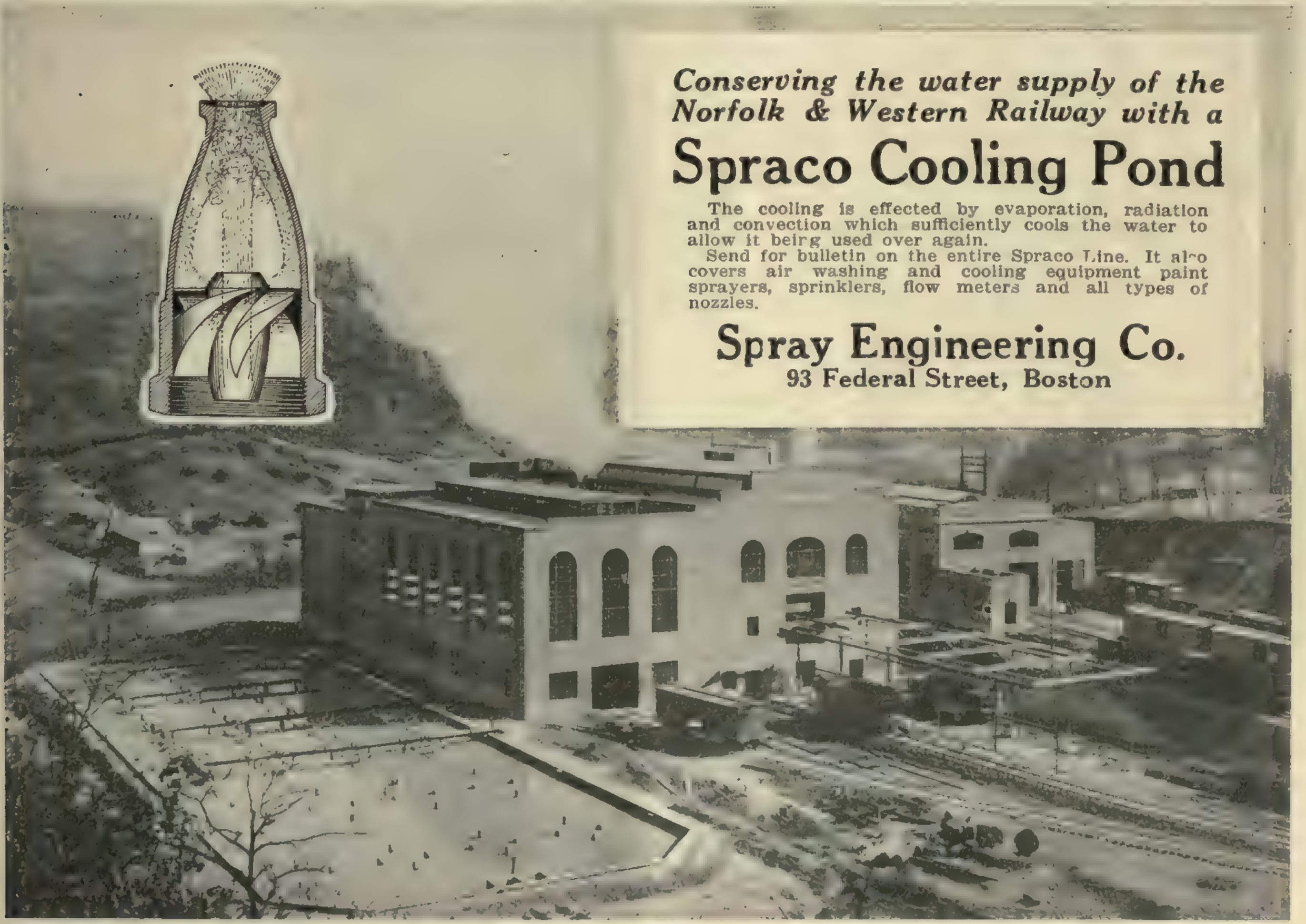

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Spraco Cooling Pond

The cooling is effected by evaporation, radiation and convection which sufficiently cools the water to allow it being used over again.

Send for bulletin on the entire Spraco Line. It also covers air washing and cooling equipment paint sprayers, sprinklers, flow meters and all types of nozzles.

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The Very Limit of Service and Dependability

Van Dorn Gearing is the result of twenty years of specialized experience with specialized equipment.

Each gear and pinion is designed to give maximum service under each particular condition.

They possess just that difference which differentiates the absolutely dependable gear from those of ordinary make. True they may have the same general outward appearance, but our years and years of experience—our wonderful equipment for scientific gear manufacture—are all invisible units that make up the difference.

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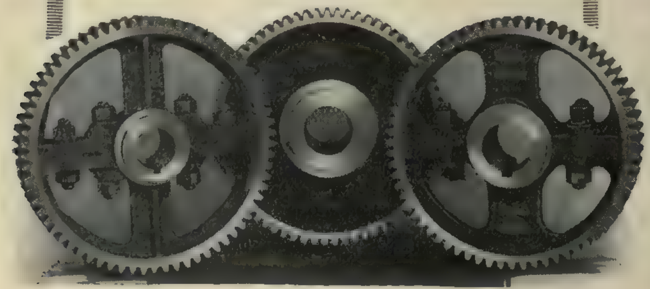

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handles coal at the rate of 60 tons per hour. The conveyor supplies two storage bins—capacity 350 tons.

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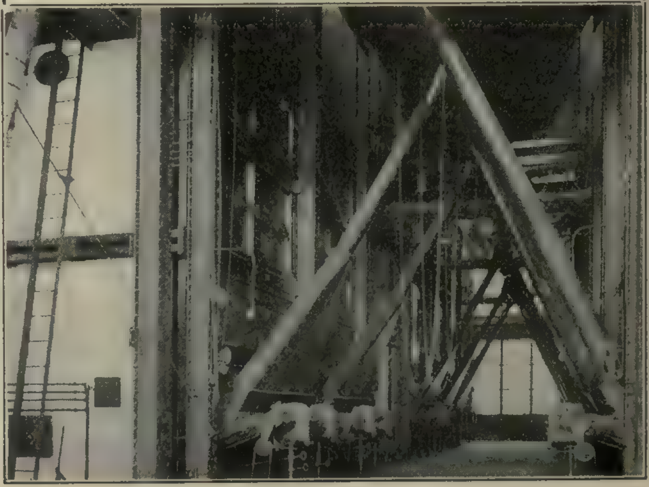

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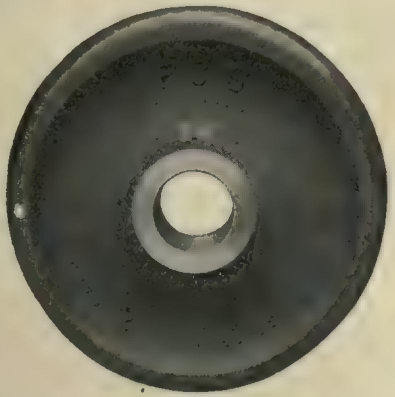

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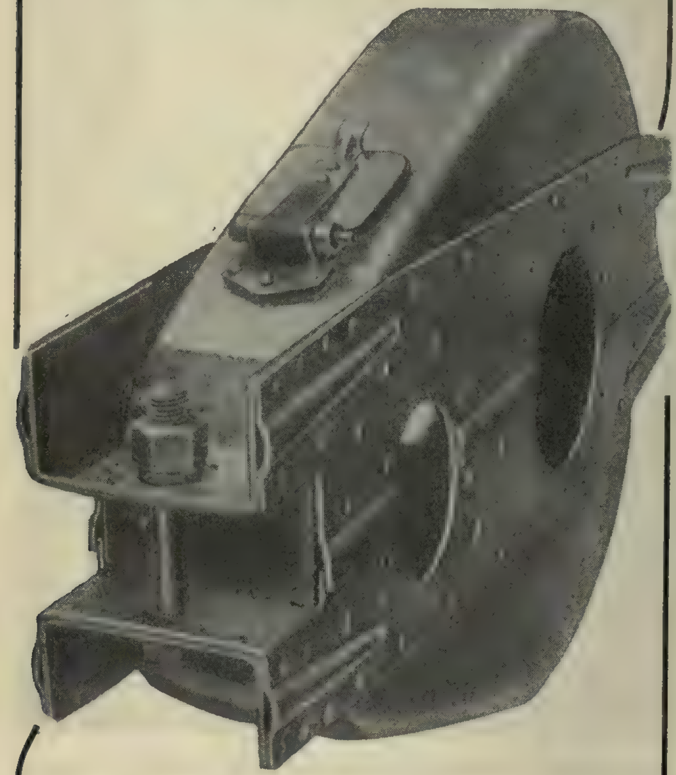

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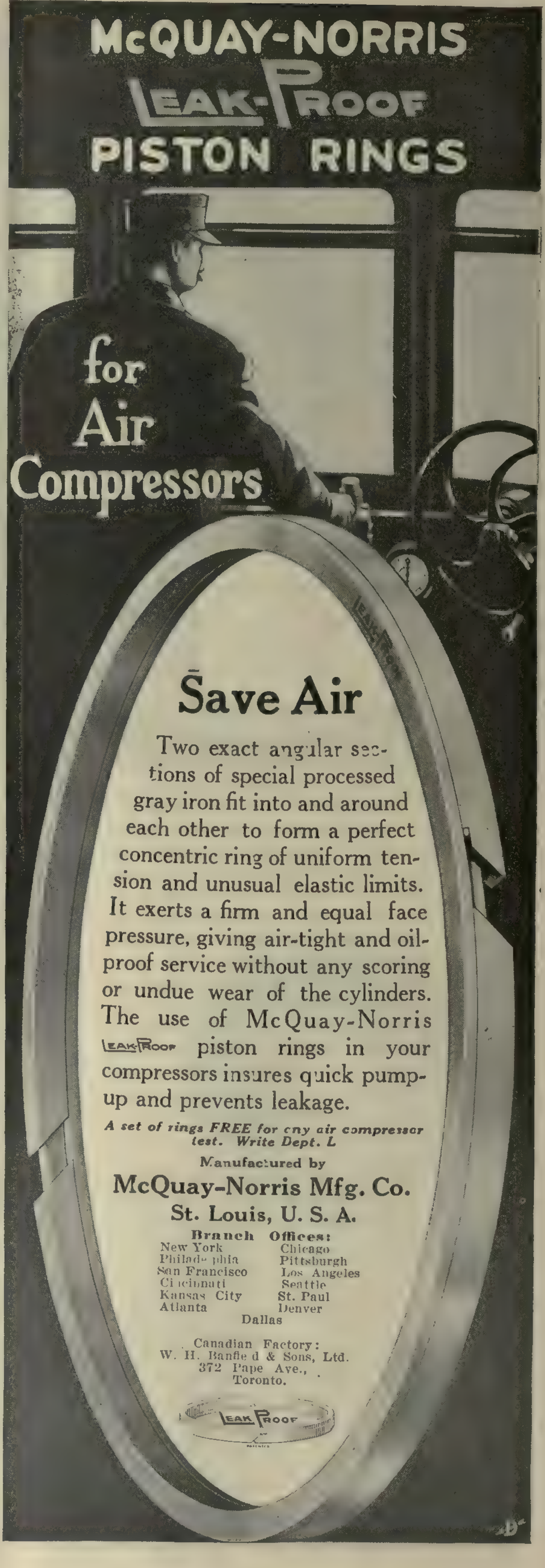

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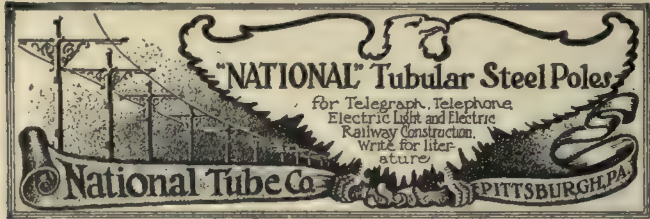
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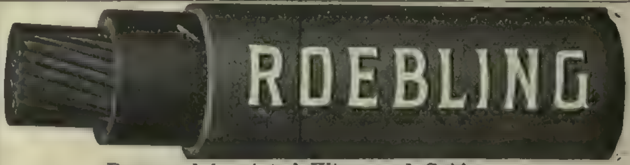

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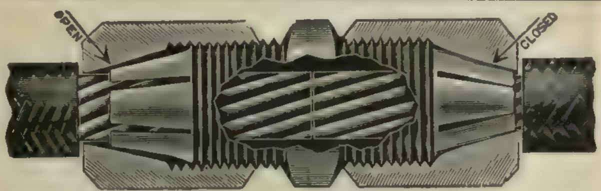

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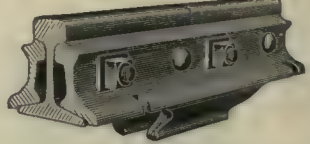

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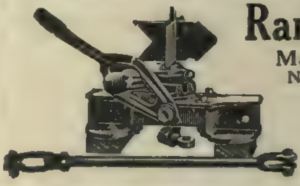

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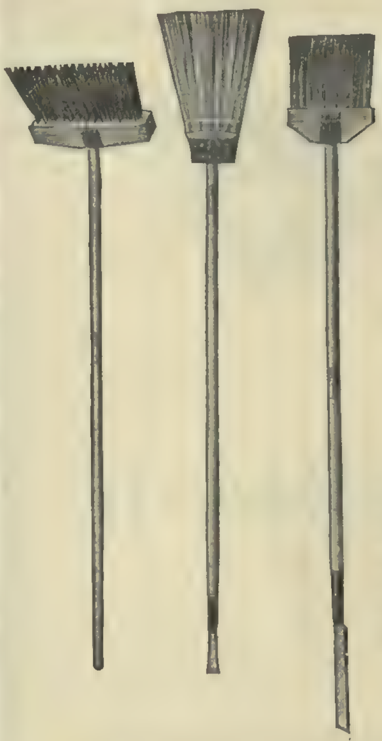

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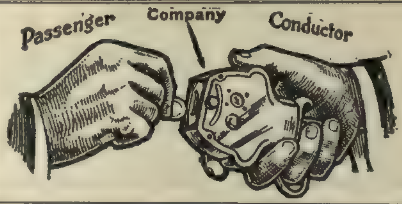

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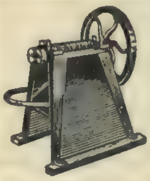

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cost as follows for single insertions:

1/16 p. (1⅛x3⅜ ins.)	$5.00	1 in. (1x2 3/16 ins.)	$3.00
⅛ p. (2⅜x3⅜ ins.)	10.00	4 inches (4x2 3/16 ins.)	11.60
¼ p. (5x3⅜ or 2⅜x7 ins.)	20.00	8 inches (8x2 3/16 ins.)	22.40
½ p. (10¼x3⅜ or 5x7 ins.)	40.00	15 inches	40.50

For space to be used within one year, to be divided to suit requirements of advertiser, provided some space is used at least once a month following first insertion:

1 page	$80 a page	18 pages	$56 a page
3 pages	72 a page	26 pages	52 a page
6 pages	64 a page	32 pages	50 a page
9 pages	62 a page	40 pages	48 a page
12 pages	58 a page	52 pages	45 a page

In replying to advertisements, do NOT enclose original testimonials, or anything that you may want returned. State your qualifications in as concise and neat a manner as you can and enclose COPIES of testimonials. In machinery ads, use a local name or address if possible so that readers can wire direct and get quick replies.

FOR SALE

4000 K. W. Generators—For Sale

Two four thousand kilowatt, 13200 volt, 25 cycle, 300 r.p.m., 3 phase, revolving field type, with shaft, base and bearings. Practically new. Can ship at once. Address H. U. Roeding & Co., Foxcroft Building, San Francisco.

Track Grinders for Sale

Two Kerwin grinders, second hand in good condition. Immediate shipment. Cumberland County Power & Light Co., Portland, Me.

Saw For Sale

No. 15 Lea Simplex cold metal saw, belt driven, diameter saw blade 15 in. Good condition. Must move quick. Will sell cheap. Commercial Truck Co. of America, Philadelphia, Pa.

Rail Grinder

A Kerwin machine, in first-class condition. Address Purchasing Department Union Traction Company of Indiana, Anderson, Ind.

FOR SALE

Relaying Rails

8 Miles, 60 lbs. per yard, with splices, for prompt shipment. Wire us your inquiries.

LURIA BROS. & CO.
Woolworth Bldg. New York

STEEL RAILS

FOR IMMEDIATE SHIPMENT

RELAYS
1,200 tons—70 lb. 400 tons—75 lb.
A. S. C. E. Section with Angles
NEW
225 tons 75 lb. with Heavy Splices
280 tons 85 lb. with Angles
1000 tons 90 lb. with Angles

Exceptional opportunity. Also large quantity other Section. *Write* or *Wire.*

ZELNICKER
WALTER A. ZELNICKER SUPPLY COMPANY
St. Louis

FOR SALE

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes.
Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Bldg. Pittsburgh, Pa.

MISCELLANEOUS WANTS

Wanted at Once

For immediate shipment any quantity of battery lead plates, sediment scrap copper and wire, brass and all other grades of scrap material. Write to us today for our prices. National Metal & Rubber Co., 31 India Wharf, Boston, Mass.

WANTED

One second-hand, 550 volt, Direct Current

Street Railway Generator

belt driven, capacity 300 to 400 K.W. Address Light, Heat, Power & Water Depts., Queen Street, Kingston, Ont.

POSITIONS WANTED

ELECTRICAL engineer, college graduate, single, age 31, 5 years' railway experience, especially maintenance and design of equipment, open for engagement. Box 1493, Elec. Ry. Journal.

ENGINEER ways and structures desires change. Ten years' experience in track, overhead, high tension, construction, etc. Married, age 31. Box 1496, Elec. Ry. Journal, Real Estate Trust Bldg., Philadelphia, Pa.

EXECUTIVE, broad experience in operation, construction, engineering, now engaged, desires better connection. Box 1468, Elec. Ry. Journal, Real Estate Trust Bldg., Philadelphia, Pa.

POSITIONS WANTED

EXECUTIVE open for position as manager of public utility. Technical engineer. Good record and references. Box 1502, Elec. Ry. Journal.

POSITIONS VACANT

APPLICATIONS for positions as blacksmith, car carpenters, truck repairmen, motor repairmen, car electrician, armature winder, painters, pitmen wanted. No trouble. State age, qualifications, experience, salary wanted, references in first letter. A-1 men only need apply. Address Box 1484, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

FOUR experienced interurban crews wanted. Must be good, clean, honest and industrious men. Permanent position for right men. Box 1485, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

WANTED at once, an all round car repair man on interurban road in Ohio, operating five cars. Box 1499, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

WANTED—Graduate engineer with electric railway maintenance of way experience. State age, experience, how soon available, and salary expected. Box 1501, Elec. Ry. Journal.

WANTED—Working car barn foreman—Must be familiar with types M and K control—all G. E. equipment; also must be familiar with the operation and maintenance of Westinghouse straight and automatic air equipment. An agreeable position with a coming concern for a man who can qualify. Tell it all in the first letter—whom you have been with, what you have been doing, salary required, and when services are available. Address "Tidewater," Box 1498, Elec. Ry. Journal.

EMPLOYMENT AGENCIES

Correspondence Service

The undersigned provides a confidential service designed to locate openings through correspondence for men earning not less than $2,500 and up to $25,000; all lines. Not an employment agency, but a constructive, initiative service, covering individual negotiations. Established 1910. Complete privacy assured; present connections in no way jeopardized. Send name and address only for explanatory details. R. W. Bixby, 111 Niagara Square, Buffalo, N. Y.

SEARCHLIGHT SECTION

FOR SALE

CARS

4—15 bench open cars with motors, trucks and air-brake equipment.

4—13 bench open cars with motors, trucks and air-brake equipment.

1—15 bench open car, no equipment.

10—10 bench open cars with single trucks and motors.

4—20′ closed cars with single trucks and motors.

TELEPHONE WIRE

15,000 pounds of No. 10 hard drawn bare copper telephone wire.

RAILWAY MOTORS

8—Brand new G. E. 201-H. railway motors complete.

AIR COMPRESSORS

35—Second-hand AA1 air compressors.

For further particulars apply to

W. R. KERSCHNER COMPANY, INC.
50 Church Street, New York, N. Y.

IMMEDIATE SHIPMENT

Turbines

2—1250 KVA. Westinghouse Horizontal Turbo Generating Units, wound for 3 phase, 60 cycles, 2200 volts. Each unit complete with 4500 sq. ft. Worthington surface condenser, circulating pump, rotary dry vacuum pump and wet vacuum pump. Designed for 150 lb. steam pressure. Turbines fitted with bronze blading.

25 Cycle Rotary Converters

2—150 KW. General Electric type T.C., 4-150-750, 25 cycle, 3 ph., 575 volt, rotary converters, 750 rpm., complete with end play and speed limit device.

200 Kilowatt 60 Cycle Rotary Converters

2—200 KW. Westinghouse 3 ph., 60 cy. rotary converters, 550 volts, 720 rpm., complete with 4—100 KW. Westinghouse Scott connected oil insulated transformers, 10,000/9500 volts prim., 430/362 volts secy.

Transformers

6—750 KVA. General Electric oil filled self cooled transformers, 4400/281 volts, with 4400-4290-4180-4070-2200-2090-1980 taps in the primary.
3—500 KW. General Electric, 60 cy., single phase transformers, 66,000 volts primary, 4400/2200 volts secondary.
3—350 KVA. General Electric, type H, 60 cy., transformers 2400/2300/2200 v. prim., 200/400 v. secy.
1—100 KVA. General Electric, type H, 60 cy. transformer, 4600 volts prim., 115-230 volts secy.
4—100 KW. Wagner single phase, 60 cycle, 6600 volts primary, 2050/2300 volts secy., complete with oil.
4—100 KW. Westinghouse, oil insulated, Scott connected transformers, 10,000/9500 v. primary, 430/362 v. secondary.
3—75 KW. Westinghouse 60 cy. transformers, 2200 v. prim., 110/220/440 v. secy.
3—50 KVA. General Electric type H, 60 cy. transformers, 900/1000/16000 v. prim. Y., 230/460 v. secy.

Also a stock of smaller sized transformers.

IMMEDIATE DELIVERY

ARCHER & BALDWIN
114-118 Liberty Street New York City
TELEPHONE 4337-4338 RECTOR

SERVICE VALUE

Scrap value for material on your shelves or in your yards is not enough. If it is operative, the roads that need it will pay service value for it.

The Searchlight Section of the Electric Railway Journal will find these roads for you.

Manufacturers who accept old equipment in part payment of new products can dispose of this promptly by advertising in the Searchlight Section of the Electric Railway Journal.

Machinery used in manufacturing and displaced by more modern tools can be sold at a fair price by advertising it in the Searchlight Section.

Wide-awake dealers, agents or representatives can be secured through little Searchlight "Want" ads.

Manufacturing sites, partners, help, capital—anything that anybody in the electric railway industry is likely to have for sale or exchange for something else—can be located or disposed of through the Searchlight Section.

The cost of putting your Wants in this projector is very slight, whether for a man, for a job, or for a market.

Searchlight Section, Electric Railway Journal

SEARCHLIGHT SECTION

Ready for Service — Immediate Shipment

No. 6. Six 52′ x 9′ 6″ Brill cars, Brill 27E trucks, 6′ 6″ wheelbase, 6″ axles, new 36″ MCB dropped forged steel wheels; four GE 66-B 125 to 150-hp. motors; new "M" control double-end operation; straight and automatic air brakes with two engineer's valves on each end of car. Speed 60 miles. Like new throughout. Ready for service. Immediate shipment.

We have purchased these splendid cars from the Wilkes-Barre & Hazelton R.R. Co. at Hazelton, Penna., and offer for quick sale at tremendous price reduction. Telegraph us for inspection order if interested for immediate shipment. The electrical equipment is installed in a superior manner. Suitable for passenger, express, freight and locomotive service. With suitable gears will pull 800-ton load 20 miles per hour.

FOR SALE: Rails, Cars, Motors, Locomotives, all types.

WANTED TO PURCHASE: All available items. Send us your offerings.

CHARLES F. JOHNSON CAR COMPANY, 120 Liberty Street, New York, N. Y.

FOR SALE

One 3 phase, 60 cycle, 2300 volt, 1800 r.p.m., G. E., 500 K. V. A.

Vertical Turbo Generator

complete with condenser, pumps and all accessories. Reply to

COLUMBIA CONSTRUCTION CO.,
1410 First National Bank Bldg., Milwaukee, Wis.

CARS FOR SALE

OPEN and CLOSED
MOTOR and TRAIL

Write for Price and Full Particulars to

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg. Philadelphia, Pa.

COMPLETE ARMATURES FOR SALE

FOR ALL THE STANDARD STREET RAILWAY MOTORS

GET OUR PRICE WE CAN SAVE YOU MONEY

America's Greatest Repair Works

CLEVELAND ARMATURE WORKS, Cleveland, O.

Do You Want a Salesman or Other Assistant?

If so, send us copy for a card under "Positions Vacant" in the Searchlight Section. The cost will be slight and the result will be both quick and satisfactory.

Get your Wants into the Searchlight

ELECTRIC RAILWAY JOURNAL, 239 West 39th St., New York

Rotary Converters

25 Cycle

One 1500 KW. Gen. Elec. HC-N, 6 ph., 263 V. D.C., 14 pole, 214 RPM.

One 600 KW. Gen. Elec. TC-A, 3 ph., 600 volt D.C., 375 volt A.C., 8 pole, 375 RPM.

Four 500 KW. Gen. Elec. HC-K, 600 volt D.C., 4 pole, 750 RPM., each rotary complete with three 165 Kva. Gen. Elec. OI SC transformers, HP-RP, 6600/5940 volts prim., 430/286/143 volts sec., also necessary panels with instruments.

One 500 KW. Westg. 3 ph., 550 volt D.C., 390 volt A.C., 6 pole, 500 RPM., with dir. conn. starting motor; A.C. and D.C. panels, and three 175 KW. Westg. oil cooled transformers, 13200 volts prim., 390 volts sec.

One 250 KW. Gen. Elec. TC-A, 3 ph., 550 volts D.C., 350 volts A.C., 4 pole, 750 RPM.

Two 250 KW. Gen. Elec. TC-D, 3 ph., 275 volt D.C., 169 volt A.C., 4 pole, 750 RPM., each with A.C. & D.C. panels, and three 100 KW. G. E., type H, single ph., oil cooled transformers, 6600/5600 volts prim., 176 volts sec.

60 Cycle

One 500 KW. Gen. Elec. HC., 6 ph., 600 volt D.C., 424 volt A.C., 6 pole, 1200 RPM., with switchboard panel and three 185 Kva. G. E., OI SC single ph. transformers, 2300 volts prim., 424 volts secondary.

One 300 KW. Westg. 2 ph., 525/575 volt D.C., with two 165 KW. Westg. oil insulated transformers, 2200 volt prim., 367/430 volt sec.

One 200 KW. Westg. 3 ph., 600 volt D.C., 370 volt A.C., 10 pole, 720 RPM., with dir. conn. starting motor.

One 100 KW. Westg. 2 ph., 550 volt D.C., 8 pole, with dir. conn. starting motor.

MacGovern & Company
INC.

114 Liberty Street, New York City

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

More than 300 different products are here listed.

The Alphabetical Index (see eighth page following) gives the page number of each advertisement.

As far as possible advertisements are so arranged that those relating to the same kind of equipment or apparatus will be found together.

This ready-reference index is up to date, changes being made each week.

If you don't find listed in these pages any product of which you desire the name of the maker, write or wire Electric Railway Journal, and we will probably furnish the information.

Acetylene Apparatus. (See Cutting Apparatus, Oxy-Acetylene.)

Acetylene Service
Oxweld Acetylene Co.

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Horne Mfg. Co.

Alloys and Bearing Metals. (See Bearings and Bearing Metals.)

Alloys, Steel and Iron.
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Automobiles and Buses.
Brill Co., The J. G.

Axles.
National Tube Co.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The

Bankers and Brokers.
National City Co.

Batteries, Dry.
Johns-Manville Co., H. W.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
More-Jones Brass & M. Co.
St. Louis Car Co.
Westinghouse Elec. & M. Co.

Bearings, Center.
Baldwin Locomotive Works.
Holden & White, Inc.

Bearings, Roller and Ball.
Gurney Ball Bearing Co.
Hess-Bright Mfg. Co.
Railway Roller Bearing Co.

Bearings, Roller Side.
Holden & White, Inc.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Zelnicker Sup. Co., W. A.

Blow Torches for Soldering and Brazing. (See Cutting Apparatus, Oxy-Acetylene.)

Blowers.
General Electric Co.
Westinghouse Elec. & M. Co.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Dearborn Chemical Co.
Johns-Manville Co., H. W.

Boiler Coverings.
Johns-Manville Co., H. W.

Boiler Tubes.
National Tube Co.

Bond Clips.
Electric Railway Improvement Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improvement Co.
Ohio Brass Co.
Oxweld Acetylene Co.

Bonding Tools.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Electric Railway.
Railway Bonding Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Bonds, Welded.
Lincoln Bonding Co.

Book Publishers.
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Etc.)
American Bridge Co.
Bates Expanded Steel Truss Co.
Electric Service Supplies Co.
Hubbard & Co.
Int'l Creosoting & Constr. Co.
Lindsley Bros. Co.
Ohio Brass Co.
Union Electric Co.

Brake Adjusters.
Holden & White, Inc.
Smith-Ward Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdy. Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Long Co., E. G.
St. Louis Car Co.

Brakes, Brake Systems and Brake Parts.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Westinghouse Trac. B. Co.

Bridges and Buildings.
American Bridge Co.

Brooms, Track, Steel or Rattan.
Paxson Co., J. W.
Zelnicker Supply Co., W. A.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.

Brushes, Carbon.
American Carbon & Battery Co.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
Dixon Crucible Co., Jos.

Buckets, Grab.
Beaumont Co., R. H.

Bumpers, Car Seat.
Electric Service Supplies Co.

Bunkers, Coal.
American Bridge Co.
Beaumont Co., R. H.

Bushings, Case Hardened and Manganese.
Bemis Car Truck Co.

Bushings, Fibre.
Diamond State Fibre Co.

Buttons. (See Badges and Buttons.)

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc. —See those headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Jewett Car Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Stephenson Co., John.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co.
Kerschner Co., Inc., W. R.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Car Stops, Automatic.
Consolidated Car-Heating Co.

Castings, Brass.
Columbia M. W. & M. I. Co.
Eureka Co.
Frankel Connector Co.
More-Jones Brass & M. Co.

Castings, Composition or Copper.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.

Castings, Gray Iron and Steel.
Amer. Brake Shoe & Fdy. Co.
American Bridge Co.
American Steel Foundries.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
Amer. Brake Shoe & Fdy. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Eclipse Railway Supply Co.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
Ohio Brass Co.
Union Electric Co.
Wood Co., Chas. N.

Ceiling, Car.—(See head lining.)

Chain and Belt Machinery.
Beaumont Co., R. H.

Charging Sets, Storage Battery.
General Electric Co.

Chemists.
Little, Inc., Arthur D.

Circuit Breakers.
Cutter Electrical & Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
Frankel Connector Co.
General Electric Co.
Hubbard & Co.
Klein & Sons, Mathias.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Cleaners and Scrapers, Track. —(See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.
Van Dorn & Dutton Co.

Cleats, Car Wiring.
General Electric Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling.—(See Conveying and Hoisting Machinery.)

Coasting Clocks.
Railway Improvement Co.

Coil Banding and Welding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Coils, Armature & Field.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Standing the Overload

What's the usual result of an overload on your car motors or compressors?

A puff of smoke—followed by a trip to the repair shop. You can eliminate these trips by using

Salamander Fireproof Wire

motor field, armature and compressor coils. You can't burn out Salamander Wire Coils. We've had them red-hot on test without any breakdown.

Send for samples and catalogs.

Independent Lamp & Wire Co., Inc.

Offices: 1737 Broadway, New York
FACTORIES: York, Pa., and Weehawken, N. J.

THE readers of technical papers are busy men. Don't expect one flash of the Searchlight to reveal them all—or one insertion of your advertisement to be read by them all. **Order your Want or For Sale Advertisement published four times or more.** If all of the insertions are not needed we will return the full amount received for whatever space is not used.

Searchlight Department,
ELECTRIC RAILWAY JOURNAL

RAILWAY UTILITY COMPANY

Sole Manufacturers
"HONEYCOMB" AND "ROUND JET" VENTILATORS
for Monitor and Arch Roof Cars, and all classes of buildings; also
ELECTRIC THERMOMETER CONTROL
of Car Temperatures.

721 W. FULTON ST.
Chicago, Ill.

Write for Catalogue

1328 BROADWAY
New York, N. Y.

Use them in your terminals—

PEREY TURNSTILES or PASSIMETERS

Faster than the ticket seller

Perey Manufacturing Co. Inc.
30 Church Street, New York City

Idealism that is Practical

To attain the highest possible standard of service is the dominating purpose which subordinates all other considerations in the designing and building of

Weston Indicating Instruments

Especially in this field of Electrical Measurement, such an ideal is thoroughly consistent with practical commercial demands. So it is that Weston pre-eminence is as well recognized from the commercial standpoint as from the scientific.

Weston Electrical Instrument Co.
21 Weston Ave., Newark, N. J.
23 Branch Offices in the Larger Cities.

Model 310 Portable Single-Phase and D.C. Wattmeter

Weston models include complete groups for Portable and for Switchboard Service on A.C. and on D.C. circuits, together with many instruments designed for special purposes. Write for particulars regarding any field.

National Railway Appliance Company

50 East 42d St., NEW YORK CITY
Chicago Washington, D. C.

RAILWAY SUPPLIES

SELLING AGENTS FOR

Tool Steel Gears and Pinions
Johnson Fare Box
Perry Side Bearings
Hartman Centering Center Plates
Wasson Trolley Bases
Garland Ventilator
Electric Arc Welders
High Class Railway Varnishes and Enamels
Elastic Car Waste

Special Agents for
Tool Steel Gear & Pinion Co.
Johnson Fare Box Co.
C. & C. Electric & Mfg. Co.
Holden & White

General Agents for Anglo-American Varnish Co.
Eastern Agents for Union Fibre Co.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
International Register Co., The.

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices.
General Electric Co.

Commutators or Parts.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Long Co., E. G.
Westinghouse Elec. & M. Co.

Compressors, Air.
General Electric Co.
Westinghouse Trac. B. Co.

Condensers.
General Electric Co.
Westinghouse Elec. & M. Co.

Conduits, Underground.
Johns-Manville Co., H. W.

Connectors, Solderless.
Frankel Connector Co.
Horne Mfg. Co.

Controller Fingers.
Horne Mfg. Co.

Controller Regulators.
Electric Service Supplies Co.

Controllers or Parts.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Kerschner Co., Inc., W. R.
Westinghouse Elec. & M. Co.

Controlling Systems.
General Electric Co.
Westinghouse Elec. & M. Co.

Converters, Rotary.
General Electric Co.
Westinghouse Elec. & M. Co.

Conveying and Hoisting Machinery.
American Bridge Co.
Beaumont Co., R. H.
Columbia M. W. & M. I. Co.
Green Engrg. Co.

Cooling Systems.
Spray Engineering Co.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The.
Long Co., E. G.
Roebling's Sons Co., John A.
Samson Cordage Works.
Union Electric Co.

Cord Connectors and Couplers.
Electric Service Supplies Co.
Samson Cordage Works.
Wood Co., Chas. N.

Couplers, Car.
Brill Co., The J. G.
Long Co., E. G.
Ohio Brass Co.
Van Dorn Coupler Co.
Westinghouse Trac. B. Co.

Couplings, Conduit.
Horne Mfg. Co.

Cranes. (See also Hoists.)
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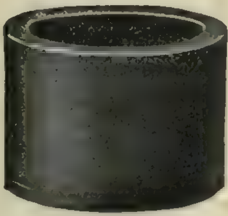

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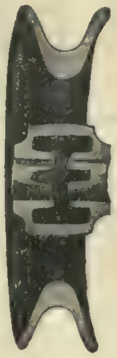

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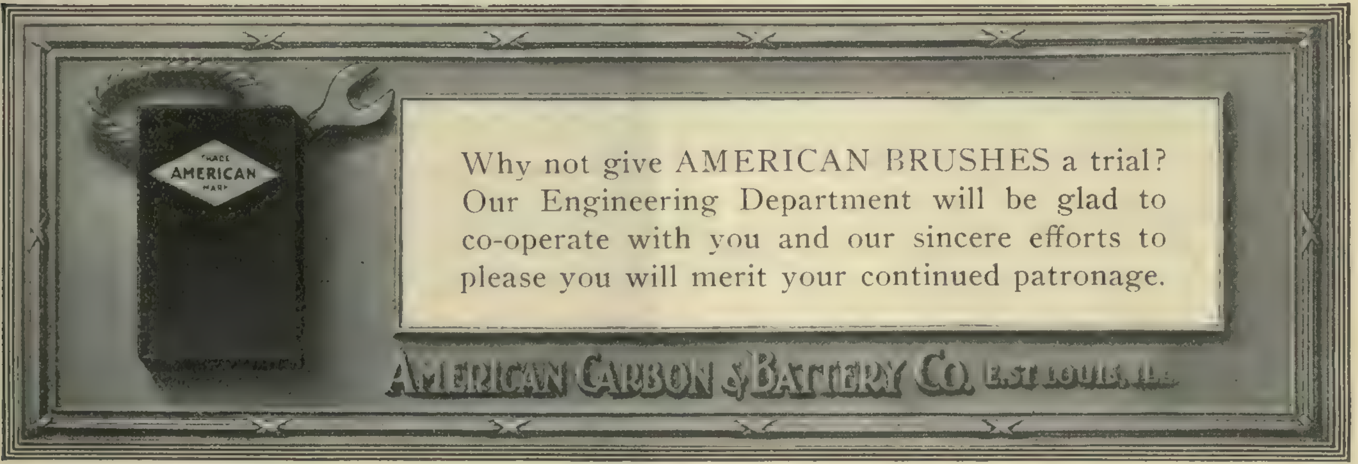
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Electric Service Supplies Co.
Patten Co., Paul B.

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Ties, Wood Cross. (See Poles, Ties, Posts, etc.)

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Electric Service Supplies Co.
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Hensley Trolley & Mfg. Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Long Co., E. G.
More-Jones Brass & M. Co.
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Star Brass Works.
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A

Page

Aluminum Co. of America 46
Amer. Brake Shoe & Fdry. Co. 45
American Bridge Co. 39
American Car Co. 67
American Carbon & Battery Co. 61
American Mason S. T. Co. 59
American Rolling Mill Co. 17
American Steel Foundries 29
American Steel & Wire Co. 48
Anderson Mfg. Co., A. & J. M. 47
Archbold-Brady Co. 46
Archer & Baldwin 54
Arnold Co., The 38

B

Babcock & Wilcox Co. 50
Baker, Wm. M. 17
Baldwin Locomotive Works, The 61
Bark River Bridge & Cul. Co. 17
Bates Expanded Steel Truss Co. 47
Beaumont Co., R. H. 42
Bemis Car Truck Co. 61
Bonham Recorder Co. 24
Bonney-Vehslage Tool Co. 52
Bridgeport Brass Co. 8
Brill Co., The J. G. 67
Buckeye Jack Mfg. Co. 51
Burch, Edw. P. 38
Byllesby & Co., H. M. 38

C

California Cor. Culvert Co. 17
Canada Ingot Iron Co. 17
Canton Culvert & Silo Co. 48
Carnegie Steel Co. 41
Carney & Co., B. J. 46
Chipman Chemical Engrg. Co. 49
Cleveland Armature Works 55
Cleveland Fare Box Co. 52
Cleveland Frog & Crossing Co. 48
Coast Cul. & Flume Co. 17
Collier, Inc., Barron G. 30
Columbia M. W. & M. I. Co. 16
Consolidated Car Fender Co. 26
Consolidated Car-Heating Co. 52
Cooper Heater Co., The 52
Corrugated Culvert Co. 17
Cutter Co. 50

D

D & W Fuse Co. 51
Daum, A. F. 51
Dayton Fare Recorder Co. 22
Dearborn Chemical Co. 50
Delaware Metal Culvert Co. 17
Diamond State Fibre Co. 46
Dixie Culvert & Flume Co. 17
Dixon Crucible Co., Joseph 50
Duff Manufacturing Co., The 51

E

Eclipse Ry. Supply Co. 59
Electric Equipment Co. 55
Electric Railway Improve. Co. 20

Page

Electric, Service Supplies Co. 13
Electric Storage Battery Co. 61
Elec'l Testing Laboratories 38
Ellcon Co. 39
Eureka Co. 51

F

Federal Signal Co. 48
Ford, Bacon & Davis 38
Ford Chain Block & Mfg. Co. 51
"For Sale" Ads 53, 54, 55
Frankel Connector Co. 47

G

General Electric Co., 32, 33, 34, Back Cover
Globe Ventilator Co. 59
Gold Car Heating & Lighting Co. 52
Green Eng'g Co. 49
Griffin Wheel Co. 43
Gurney Ball Bearing Co. 10, 11

H

Hale & Kilburn Co. 21
Hardesty Mfg. Co., R. 17
Hartshorn Co., Stewart 52
"Help Wanted" Ads 53, 54, 55
Hensley Trolley & Mfg. Co. 61
Hess-Bright Mfg. Co. 27
Holden & White, Inc. 59
Horne Mfg. Co. 61
Hubbard & Co. 14
Hunt & Co., Robert W. 38

I

Illinois Cor. Metal Co. 17
Independence Culvert Co. 17
Independent Lamp & Wire Co. 57
Ingersoll-Rand Co. 59
International Creo. & Con. Co. 46
International Register Co., The 52
International Steel Tie Co., The 9
Iowa Pure Iron Culvert Co. 17

J

Jackson, D. C. & Wm. B. 38
Jeandron, W. J. 59
Jewett Car Co. 45
Johnson Car Co., Chas. F. 55
Johns-Manville Co., H. W. 40

K

Kentucky Culvert Co. 17
Kerite Insulated Wire & Cable Co. 47
Kerschner Co., Inc., W. R. 54
Kilby Frog & Switch Co. 49
Kinnear Mfg. Co. 52
Klein & Sons, Mathias 46
Kuhlman Car Co., G. C. 67

L

Page

Lee-Arnett Co. 17
Lincoln Bonding Co. 19
Lindsley Bros. Co. 46
Little, Inc., Arthur D. 38
Lone Star Cul. Co. 17
Long Co., E. G. 61
Lyle Cor. Culvert Co. 17

M

McCardell & Co., J. R. 46
McGraw-Hill Book Co., Inc. 65
MacGovern & Co., Inc. 55
McQuay-Norris Mfg. Co. 44
Marsh & McLennan 46
Michigan Bridge & Pipe Co. 17
Montana Culvert & Flume Co. 17
More-Jones Brass & Metal Co. 40
Morgan Crucible Co. 63
Murphy Iron Works 50

N

Nachod Signal Co. 47
National Brake Co. 37
National City Co. 38
National Pneumatic Co. 23
National Railway Appliance Co. 57
National Tube Co. 46
Nebraska Culvert & Mfg. Co. 17
Nelsonville Brick Co. 49
Nevada Metal Mfg. Co. 17
New England Metal Cul. Co. 17
New York Switch & Cross. Co. 48
Niles-Bement-Pond Co. 51
North-East Metal Culvert Co. 17
Northwestern Sheet & Iron Wks. 17
Nuttall Co., R. D. 63

O

Ohio Brass Co. 6, 7
Ohio Cor. Cul. Co., The 17
O'Neall Co., W. Q. 17
Oxweld Acetylene Co. 51

P

Packard Electric Co. 51
Page & Hill Co. 46
Page Woven Wire Fence Co. 47
Pantasote Co., The 52
Patten Co., Paul B. 52
Paxson Co., J. W. 49
Pennsylvania Metal Cul. Co. 17
Perey Mfg. Co., Inc. 57
"Positions Wanted" Ads 53
Power Specialty Co. 50

R

Rail Joint Co. 48
Railway Bonding Co. 38
Railway Improvement Co. 31
Railway & Industrial Eng. Co. 12
Railway Roller Bearing Co. 66
Railway Track-work Co. 17
Railway Utility Co. 57

Page

Ramapo Iron Works 48
Richey, Albert S. 38
Road Supply & Metal Co. 17
Roebling's Sons Co., John A. 46
Rooke Automatic Register Co. 52

S

St. Louis Car Company, The 45
Samson Cordage Works 63
Sanderson & Porter 38
Sangamo Electric Co. 25
Scaife & Sons Co., Wm. B. 49
Scofield Engineering Co. 38
Searchlight Section 53, 54, 55
Second Hand Equip. 53, 54, 55
Simmen Automatic Railway Signal Co. 48
Sioux Falls Metal Cul. Co. 17
Smith Heater Co., Peter 52
Smith-Ward Brake Co. 63
Standard Steel Works Co. 43
Spokane Cor. Cul. & Tank Co. 17
Spray Engineering Co. 41
Standard Woven Fabric Co. 51
Star Brass Works 59
Stephenson Co., John 67
Stephenson Sons & Co., S. 38
Stone & Webster Eng'g Corp. 38

T

Tennessee Metal Cul. Co. 17
Thayer & Co., Inc. 44
Titanium Alloy Mfg. Co. Front Cover

U

Union Electric Co. 50
Union Spring & Mfg. Co. 61
Universal Lubricating Co., The 63
Universal Safety Tread Co. 59
Utah Cor. Cul. & Flume Co. 17

V

Valentine-Clark Co., The 46
Van Dorn Coupler Co. 28
Van Dorn & Dutton Co., The 42
Virginia Metal Cul. Co. 17

W

"Want" Ads 53
Wason Mfg. Co. 67
Western Metal Mfg. Co. 17
Western Red Cedar Ass'n 15
Westinghouse Elec. & Mfg. Co. 2, 5
Westinghouse Traction Brake Co. 4
Weston Elec'l Instrument Co. 57
White Companies, The J. G. 38
Wisch Service, The P. Edw. 62
Wood Co., Chas. N. 48
Woodmansee & Davidson, Inc. 38
Wyatt Metal Works 17

Z

Zelnicker Supply Co., Walter A. 53

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VIII—Direct-Current Generators and Motors.
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X—Power Plants.
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XIII—Interior Wiring.
XIV—Illumination.
XV—Industrial Motor Applications.
XVI—Electric Railways.
XVII—Electric Commercial Vehicles.
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XIX—Electrochemistry.
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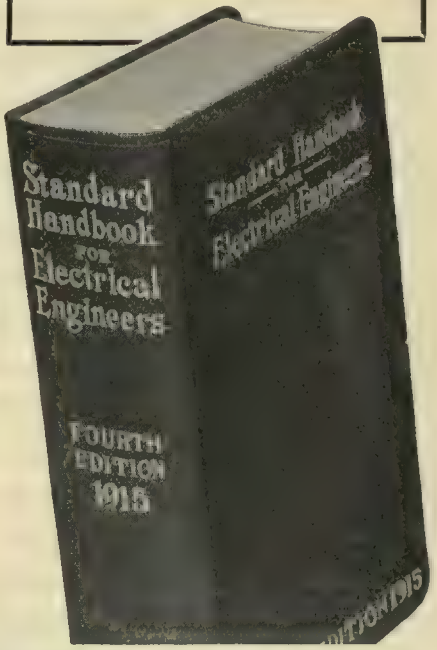
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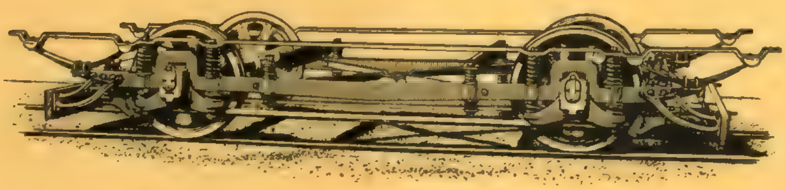

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VOLUME XLIX, No. 20 NEW YORK, MAY 19, 1917 PAGES 903 TO 944

CONTENTS

Interurban Cars with Off-set Central Vestibules

The Jamestown, Westfield & Northwestern Railroad has placed in service some high-speed cars having central entrance vestibules to separate passenger and smoking compartments. Split-field motors and multiple-unit control are used to save weight........................Page 907

N.E.L.A. Committees Summarize Technical Progress

The reports which were presented by title at the New York meeting of the National Electric Light Association last week contain the results of investigations in power generation and distribution. They show considerable activity in 1916................................Page 912

Higher Revenues Requested by New York Railways

Special electric railway committee informally shows to First and Second District Commissions the need of financial relief. Six-cent fare suggested up-state, and two-cent transfer charge in New York City. Formal hearings to be held soon................................Page 916

EQUIPMENT AND ITS MAINTENANCE.....922

Tool Holder for Economical Use of Cutting Steel—*By Walter S. Titus.*
Filing System for Tracings—*By F. J. Foote.*
Waste from Coal Mines Used in Seattle, Wash.
Novel Truck for City Service.
Twenty Men Lay ¾ Mile of Rail Per Day—*By T. W. Shelton.*
Home-Made Reinforced Concrete Poles at Richmond.
Guard for Tram Rail Made by Electric Welding—*By D. B. Moist.*
New M. C. B. Coupler for Interurban Service.

EDITORIALS 903

A Chance to Improve Operating Conditions.
How the Commissions Can Help.
Wages, Fares and Dividends.
Coal Prices and Power Rates.
The Financial Value of Master Mechanics.
The Prospect for Advancement in a Job.
Destructive Postage Taxation.
New Era for Electric Railway Industry.

P. S. R. A. DISCUSSES WAR PROBLEMS AND INCREASED FARES 911

ELECTRIC TRAMWAYS IN AUSTRALIA......915

WAR REVENUE TAX HEARING...........918

WAR-TIME ECONOMIES 919

CO-OPERATION BETWEEN RAILWAYS AND N. S. C............................920

COMMUNICATIONS 921

Practical Trials Suggested for Equalizer-Bar Trucks.
Higher Fares Are Necessary.

NEWS OF ELECTRIC RAILWAYS...........927

Progress in Chicago Situation.
Middlesex Wage Decision.
Rails Removed at Night.
Strike on I. U. T. Line.
Preparing for Cincinnati Work.
Programs of Association Meetings.

FINANCIAL AND CORPORATE............931

The War and the Utilities.
Staten Island Merger Disapproved.

TRAFFIC AND TRANSPORTATION..........935

Pennsylvania Jitneys Lose in Court.
Municipal Men Get Increase.
Jitney Insurance Question in Washington.
Los Angeles Anti-Jitney Men Multiply.
Service Reductions in Tacoma.
Auto Drivers Urged to Use More Cars.

LEGAL NOTES 937

PERSONAL MENTION 938

CONSTRUCTION NEWS 939

MANUFACTURES AND MARKETS...........941

Present Business and Economic Conditions.
Ties Purchased in 1915.
New Hydroelectric Construction in France.
Large Size Catalog Favored.

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THE PRESIDENT'S PROCLAMATION
April 15, 1917

"TO the men who run the railways of the country, whether they be managers or operative employes, let me say that the railways are the arteries of the nation's life, and that upon them rests the immense responsibility of seeing to it that those arteries suffer no obstruction of any kind, no inefficiency or slackened power.

"To the merchant let me suggest the motto, 'Small profits and quick service'; and to the shipbuilder the thought that the life of the war depends upon him. The food and the war supplies must be carried across the seas no matter how many ships are sent to the bottom. The places of those that go down must be supplied and supplied at once.

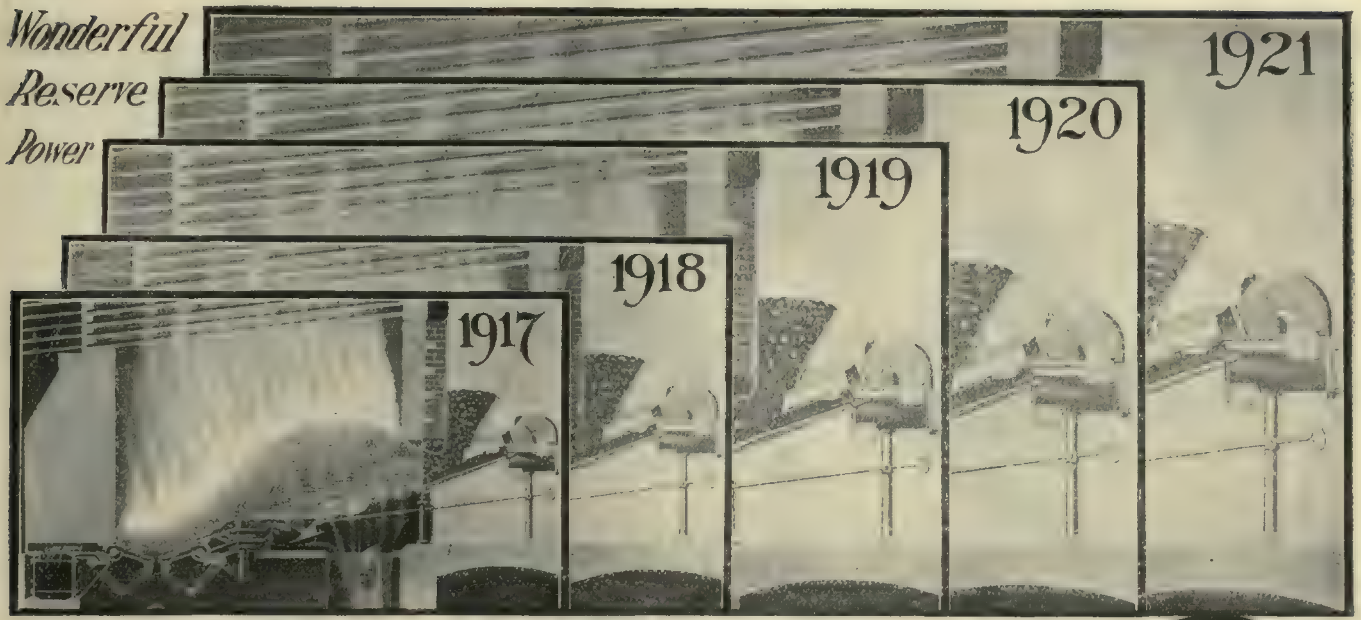
"To the miner let me say that he stands where the farmer does. The work of the world waits on him. If he slackens or fails, armies and statesmen are helpless. He also is enlisted in the great service army.

"The manufacturer does not need to be told, I hope, that the nation looks to him to speed and perfect every process; and I want only to remind his employes that their service is absolutely indispensable and is counted on by every man who loves the country and its liberties.

"It is evident to every thinking man that our industry on the farms, in the shipyards, in the mines, in the factories, must be made more prolific and more efficient than ever, and that they must be more economically managed and better adapted to the particular requirements of our task than they have been; and what I want to say is that the men and the women who devote their thought and their energy to these things will be serving the country and conducting the fight for peace and freedom just as truly and just as effectively as the men on the battlefield or in the trenches.

"This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and every woman assume the duty of careful, provident use and expenditures as a public duty, as a dictate of patriotism which no one can now expect ever to be excused or forgiven for ignoring."

Air Brakes control the Railroad Traffic Movement of the Nation. In the Crisis now confronting us, we shall co-operate even more earnestly than in the past to the end of the most efficient railway operation possible. Suggested by the Westinghouse Air Brake Company.



Not Too Big Now-

Nor Too Small in 1921

—Gigantic Overload Capacity

The wonderful flexibility
of—

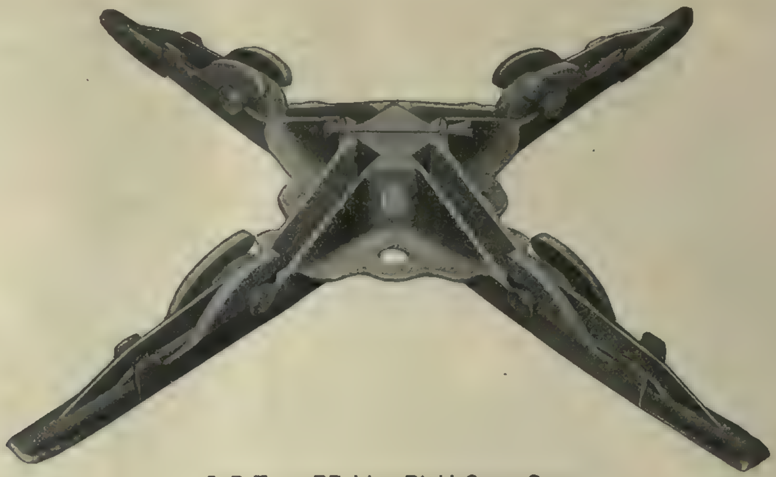
**The Westinghouse
Underfeed Stoker**

—insures ample power to meet
the demands of business growth

Write for Descriptive Circular

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

Westinghouse



O-B Type ER Live Rigid Cross-Over

Keep the Cars Moving

When cars are held up or re-routed while a cross-over is being renewed you lose money and "good-will." And both of these are hard enough to get. So keep the delays short and infrequent with O-B Line Material.

Follow the installation of an O-B Type ER Cross-Over:

Wires are laid in place, without cutting, compression block set on them and cotter pin inserted, and Cam Tips are installed (see illustrations at left). That's all there is to it.

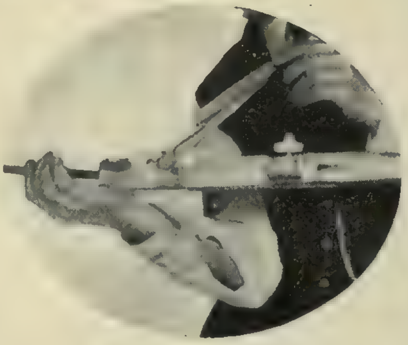
Everything has been reduced to the utmost simplicity; small, hard-to-handle parts are eliminated.

Besides O-B Type ER Live Rigid Cross-Overs in 8°, 15°, 23°, 35° and 90° angles, there are Type E Live and Type C Insulated adjustable Cross-Overs for any angle, Type E and Type D Frogs, Type C Section Insulator and Type B Strain Plate, all equipped with these same labor saving renewable Cam Tips.

Another thing—all malleable parts are protected by O-B Sherardizing, tips are made of O-B Bronze, which means minimum maintenance.

Let O-B Cam Tips simplify your line problems.

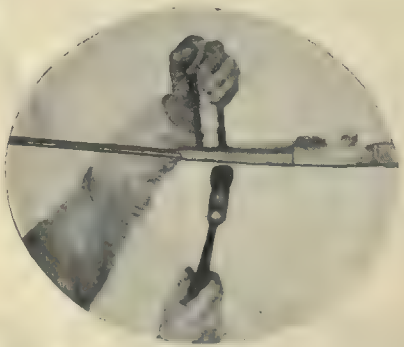
The Ohio Brass Co.
Mansfield, Ohio



Slip tip under hooks—

turn over and—

down on the wire—



clinch the tips and the job is done.

Renewal is just as simple.

Nearly Got It This Morning

"We were bringing the early commuters in from Meadowville.

"Down at the A. & B. crossing the fog was so thick I couldn't see and didn't hear anything so I gave the come ahead. No regular train due there then, anyway.

"Just as we got over a fast freight rounded that curve and went roaring by.

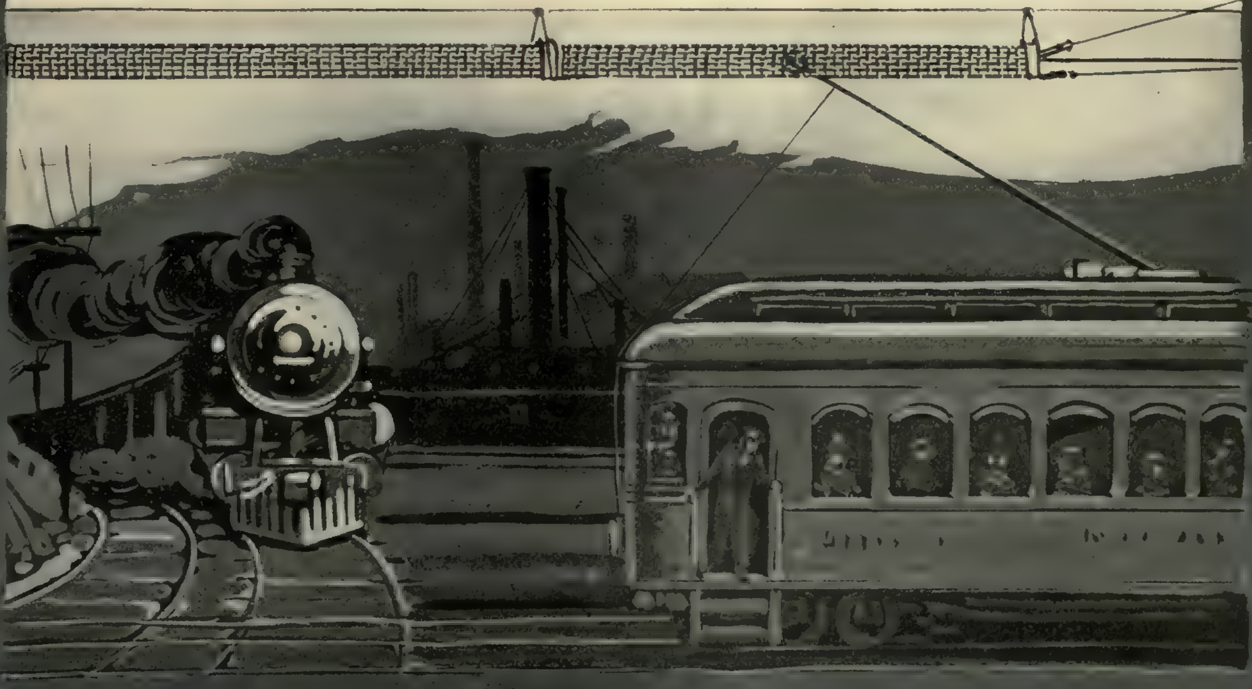
"That was close enough. But I certainly shivered when I found that the wheel was off the trolley wire and running on that wire trough. That trough was the thing that saved the whole bunch of us."

National Railroad Trolley Guard (Pat.) is made of open wire mesh formed into an inverted trough. It catches the wheel when it jumps and furnishes power to carry the car and its passengers to safety.

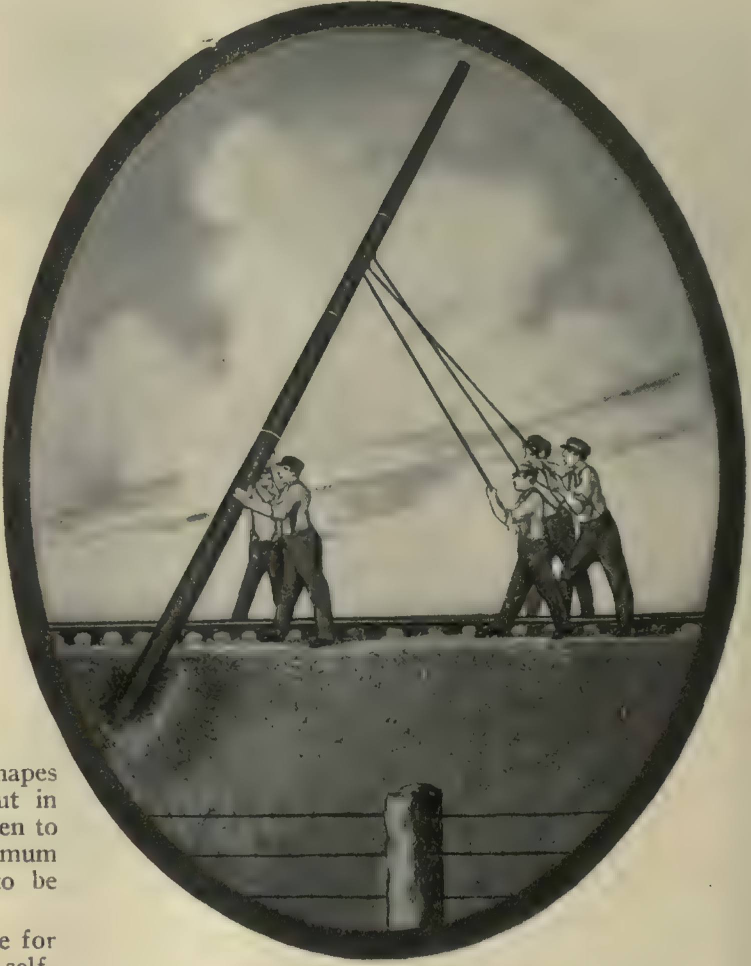
Sold exclusively by

The Ohio Brass Co.

Mansfield, Ohio



The
ELRECO
Tubular Pole
is the
Strongest
Practicable Pole



One of the most efficient structural shapes known to engineers is the I-beam. But in utilizing an I-beam due care must be given to its installation with respect to the maximum strength of the section and the load to be carried.

The impracticability of such a structure for withstanding strains in *all* directions is self-evident.

The only shape that combines the highest limit of efficiency in unit weight for all-around strength is the circular tube.

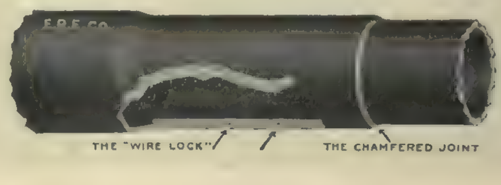
As the circle is the symbol of perfection in geometry, so is the tube the symbol of perfection in poles.

For solid proof consider this case. A 30 ft. Elreco Tubular Pole made up of 6 in., 5 in. and 4 in. sections will weigh about 50 lb. lighter and cost about $1.00 less than any other form of metal pole of the same all-around strength.

Elreco Tubular Poles are not in use by hundreds of thousands because they were the only ones available in the past, but because they *were* and *are* the best.

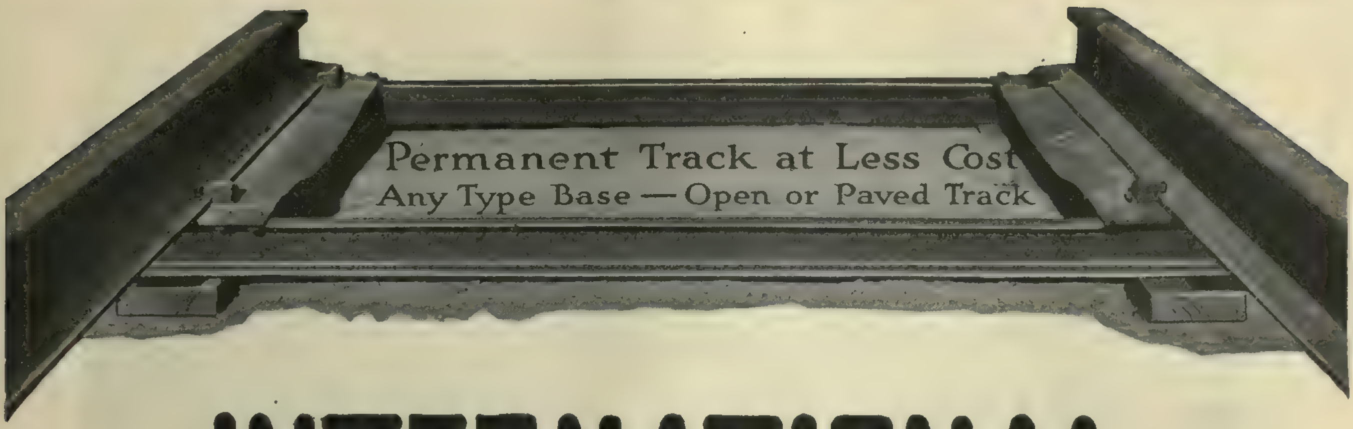
Elreco Tubular Poles have made good *at all times* as the best poles, against every other form, style and shape of pole conceivable.

In the City of Chicago more than 50.000 Elreco Poles are in service. Other Cities throughout the World have their proportionate share.



ELRECO
Tubular Poles
Combine
Lowest Cost
Lightest Weight
Least Maintenance
Greatest Adaptability

ELECTRIC RAILWAY
EQUIPMENT CO.
Cincinnati, Ohio
New York: 30 Church Street


Permanent Track at Less Cost
Any Type Base — Open or Paved Track

INTERNATIONAL
STEEL TWIN TIES

30%-80% Saving in Cost of Fastenings

When you buy an International Steel Twin Tie you buy a complete 6-ft. track unit (with exception of rails) all ready to lay. It requires no tie rods, plates or spikes with the necessary installation labor. Four rugged malleable clips drop into each end plate, and when wedged into position hold the rail to the tie against shock, vibration and wear.

Here is a saving that easily amounts to 33⅓% of the cost of track materials exclusive of rails. And the better method of rail fastening makes the track more secure—66% fewer fastenings to come loose and cause trouble—increased holding power.

In dollars and cents this is the smallest saving made possible by the use of International Steel Twin Ties—labor, foundation materials and maintenance are the big ones.

Our next advertisements tell about them.

Let us submit comparative estimates for your job.

Prompt Deliveries Made From Stock

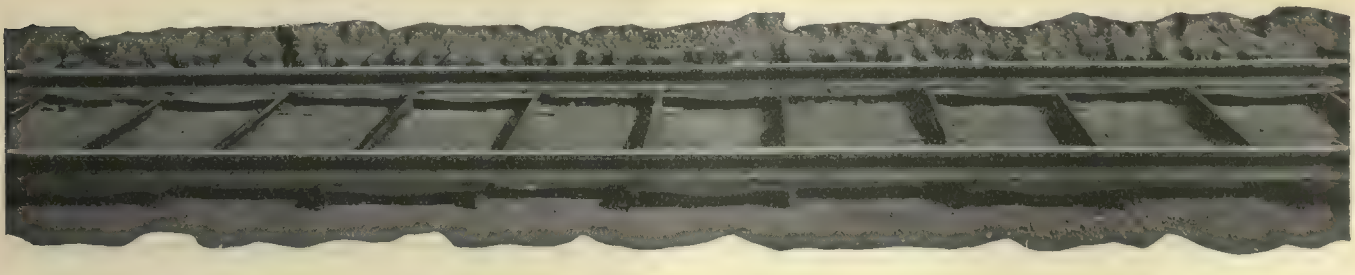
The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co., Los Angeles, Cal.
San Francisco, Cal. Seattle, Wash.
R. J. Cooper Co., Salt Lake City, Utah.
J. E. Lewis & Co., Dallas, Texas
Maurice Joy, Philadelphia
William H. Zeigler, Minneapolis, Minn.



Phono-Electric

—the wire for smoke and grime

The Norfolk & Western Railway is one of the greatest coal-handling roads in the world.

During the electrification work many monster smoke-belching locomotives passed under the Phono-Electric contact wire.

Even today, all passenger trains are operated by steam.

But Phono-Electric is a contact wire whose composition makes it absolutely indifferent to a smoke or acid-laden atmosphere.

Phono-Electric is as dependable in a chemical sense as it is in a physical sense.

Bridgeport Brass Company, Bridgeport, Connecticut

2041

"Always a Good Word for 'em"
Says New Orleans About Its

ILLUMINATED CAR SIGNS

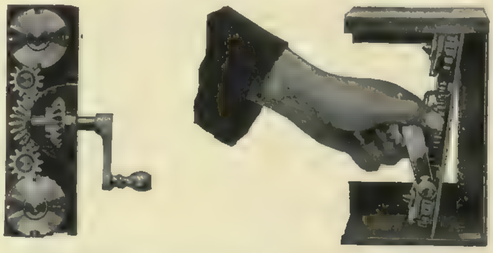
The perfect mechanisms in our Illuminated Car Signs are just one feature in the satisfaction they offer our customers.

If the conductors found our signs hard to operate they would not hesitate to make their opinion known.

Likewise if the public found our signs hard to read they would not keep their opinion concealed.

Our Illuminated Signs are right both mechanically and visually.

Write for complete data.



Driving Mechanism of Keystone Car Sign, Showing Construction and Ease of Removal

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

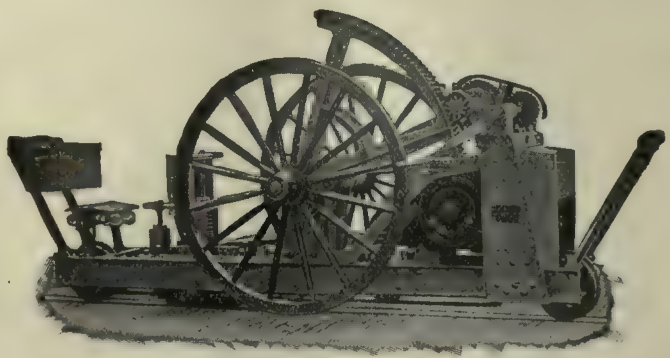
PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto

Proper Track Grinding Enormously Increases the Useful Life of Rails



Are you going to the enormous expense of relaying rail and pavement when you can increase the useful life of your track—by using the

Reciprocating Track Grinder

Here's a case in point from the experience of the Connecticut Company. The job was on an 8000-foot section of 7″ 70-lb. T-rail. The joints were badly hammered and the rail was corrugated in many places.

After the low spots had been built up by welding, the entire surface was smoothed down with a Reciprocating Grinder.

Result—

a perfect track and a saving of about $20,000.

The Reciprocating Grinder makes these savings without penalizing your transportation service.

Railway Track-work Co.

30th and Walnut Sts., Philadelphia, U. S. A.

Abbott Rail-Joint Plates

make joints the strongest part of the track

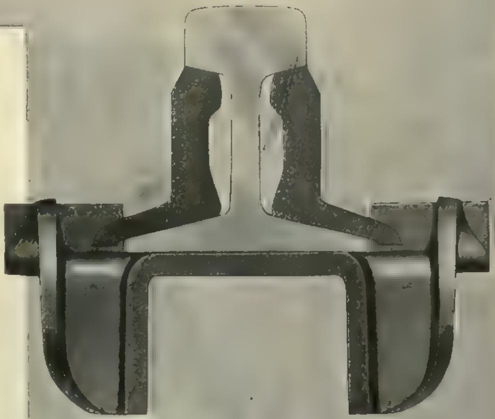
AS an independent part, the Abbott Plate can be *and is* made harder, stronger and more elastic than the splice bars.

A slight camber at its center, together with the high resilience of the axle steel we use, brings the rail ends to bear first, until as the wheel load approaches, the plate depresses into a full flat bearing with the rail bases and gives them the solid support of the two joint ties.

The strength and efficiency of this plate must be evident from the pictures. The combination of reversed flanging with 3-inch vertical depth of metal under the rail ends provides for internal stresses and brings the wheel load upon the joint ties in the same manner as the load on a short deck bridge is distributed upon its piers.

Service records demonstrate that Abbott Joint Plates will repay the cost of their installation during the first year by the saving in maintenance labor, at the same time make smooth running track surface, prevent the rail ends from battering, splice bars from bending or wearing, bolts from stretching; also will act as anti-creepers, and rail-end guides, affording temporary protection where splice bars become loose.

Ask for our booklet "Improved Track Appliances." 288



The ABBOTT RAIL JOINT PLATE
"BUILT LIKE A BRIDGE"

Lackawanna Steel Company

LACKAWANNA, N. Y.

ATLANTA	CHICAGO	DETROIT	ST. LOUIS
BOSTON	CINCINNATI	NEW YORK	SAN FRANCISCO
BUFFALO	CLEVELAND	PHILADELPHIA	HAVANA

For your

LINE O' TRACK

use

TRACKOLINE

About the hardest place in the world to keep arid are the Tropics. Vegetation there springs up almost overnight and still here's a

TRACKOLINE EQUIPMENT

that's doing wonderful work in the Tropics on a Panama Railroad.

If TRACKOLINE can successfully combat that kind of insistent vegetation what will it do for your tracks.

You should prepare for the summer now. Don't give the weeds a head-start. Don't wait until they come up to kill them. Don't let them come up at all.

Every barrel of TRACKOLINE means a mile of clean track.

TRACKOLINE **cleaned**

Fill out the Coupon
Let us tell you
"Facts About
Clean Tracks"

Protective Materials Corp.,
Vanderbilt Bldg.,
New York

Please tell me how to prevent weed-growth this summer. Send your bulletin—"Facts About Clean Tracks."

Name ....

Address ....

Protective Materials Corp.

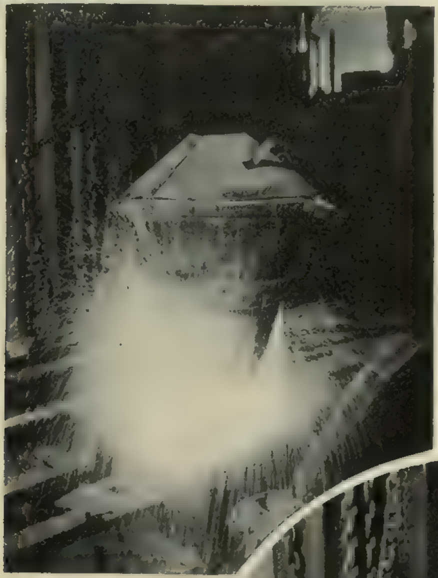
Vanderbilt Bldg., 51 East 42d St., New York

Approaching perfection

on the Viaduct Approaches of the
Omaha and Council Bluffs
Street Railway with

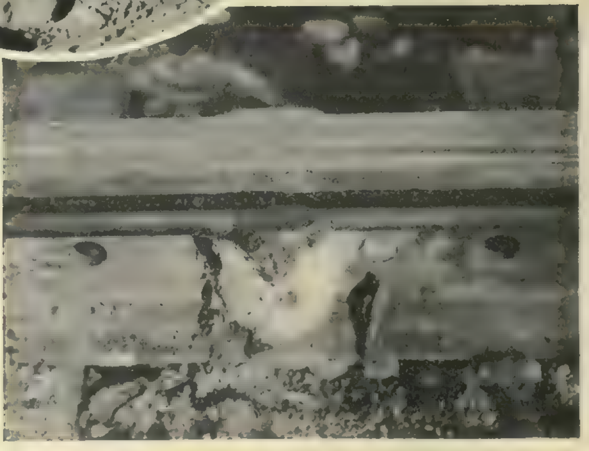
GOLDSCHMIDT THERMIT WELDS

Placing the mould



Pouring the Weld

Welded Joint ready to be trimmed and ground



Finished weld

On this job the welds are being made between ordinary 70-lb. A. S. C. E. rail and Lorain Sec. 97-424 7″ groove rail.

That Goldschmidt Thermit Welds are superior in endurance and efficiency to other welds is evidenced by the fact that all the approach joints of this road are being Thermit welded.

Let us tell you how to get **continuity of rail without continuity of joint expense.**

Goldschmidt Thermit Co.

120 Broadway
New York

329-333 Folsom St., San Francisco **7300 So. Chicago Ave., Chicago** **103 Richmond St., West, Toronto, Ont.**

The Erico Portable Welder

For welding rail bonds can work for you in Daylight

Daylight hours are the hours of best work, biggest output, lowest cost and least annoyance to the people who live along the track.

The Erico Portable Welder does its work and makes its getaway so quickly that you needn't hesitate to use it freely during the daylight hours of regular traffic. It's the

Real Daylight Saver

ERICO
THE LINE OF LEAST RESISTANCE

The Electric Railway Improvement Co.

Cleveland

Imperial Flood Light Projectors

Type SDX

Type SCE
(1000 watts)

For Protection of Property and Continuance of Outdoor Work at Night

Imperial Flood Light Projectors throw a strong, steady beam of light which can be directed and regulated at will to "pick up" and identify moving and stationary objects. They can also be used to particular advantage to illuminate Terminals, Freight Yards, Shops, Round Houses, Bridges, Tunnels, etc.

Portable types are exactly suited to night work on rolling stock and right-of-way.

These Projectors are made in many distinct types to meet requirements and in sizes to take flood lighting Mazda lamps up to 1000 watts, 105-130 volts. All are absolutely weather-proof and built to withstand hard usage.

Full Data on Flood Light Projectors and Expert Advice Regarding Your Requirements Will Be Given on Request.

Type SDA

Type SDY

Type SDR

CROUSE-HINDS COMPANY

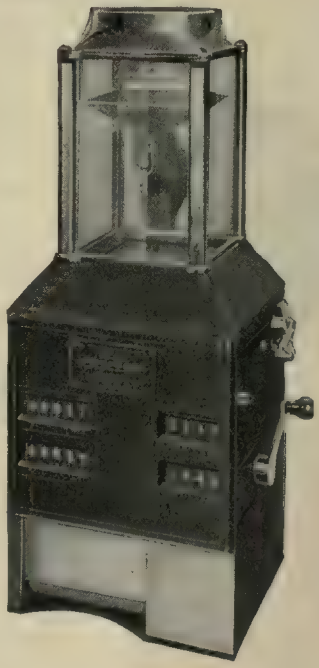
SYRACUSE, N. Y., U. S. A.

NEW YORK BOSTON CHICAGO

Hold a Stop-Watch on the Johnson Fare Box and Metal Ticket System

and you'll find that it collects, counts and registers nickels, dimes, pennies, and **two** classes of metal ticket-tokens, **faster** than any other fare collection device.

Consider, further, that all these various classes of fares are deposited in **one** hopper, thus preventing mistakes, delays and disputes—that speed in collection is promoted by combining all the fare counting and registering mechanism in **one** unit—that all cash fares collected are (after registration) at once available for change-making, and the metal ticket-tokens for re-sale.



It's easy to grasp the fact that **the Johnson System will speed up schedules,** improve the road's relations with the public, and insure its getting **all** the revenue it earns.

And that is precisely what the Johnson System has done and is doing for some of the most progressive roads in this country—what it can and will do for you.

Why not give it a try-out?

Johnson Fare Box Company

Jackson Boulevard and Robey Street, Chicago
50 East 42nd Street, New York

INTERNATIONALS

Meet the Test of Raising Your Earnings

There are many differences of opinion about fare collection practices, but you won't dispute that the best practice is the one that will produce the greatest revenue per car mile.

Do you know that we are willing to put our practice to that test on your lines and without cost to you?

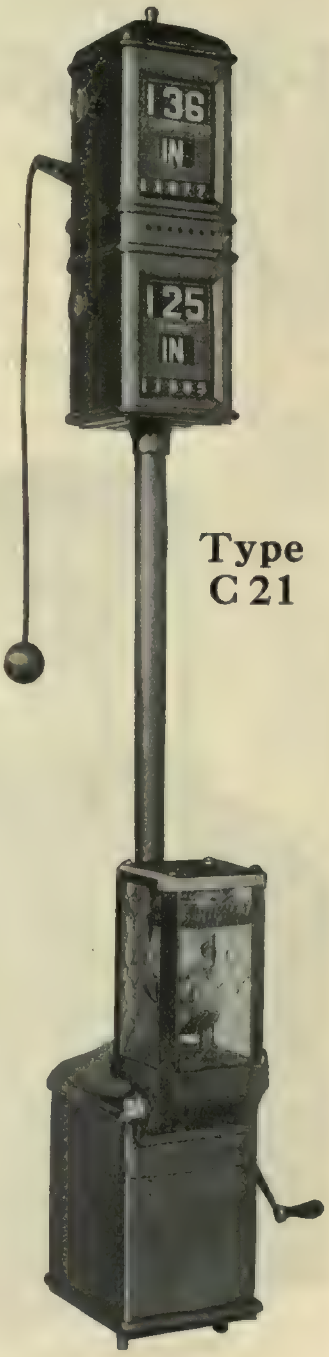
We ask you **first** for the opportunity to study your conditions as to types of cars, classifications of fares and density of travel.

We ask you **then** to permit us to place the best adapted International Coin or Coin and Ticket Register upon alternate cars of selected routes.

We ask you **finally** to purchase our equipment, only if it makes good in the one big way that you want it to make good—more cents per mile.

Cars loaded quicker

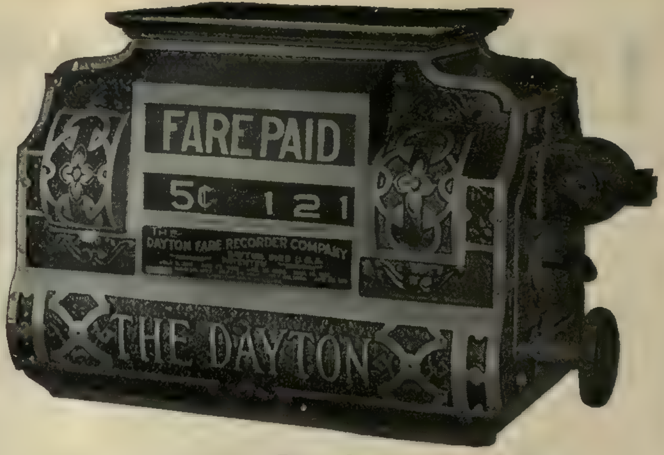
is an additional benefit that will be yours when **all** the cars on a line are equipped with the fast and accurate Internationals.



The International Register Co.

15 South Throop St., Chicago, Ill.

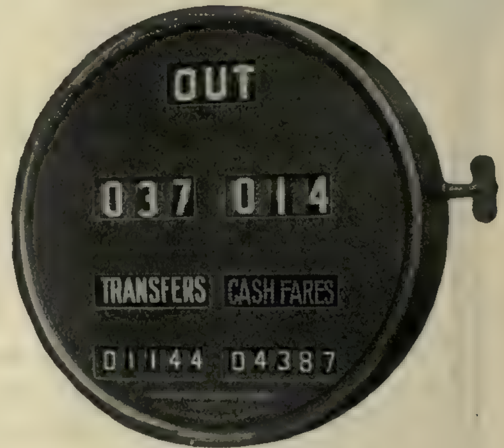
If you are
in the market
for any kind of a



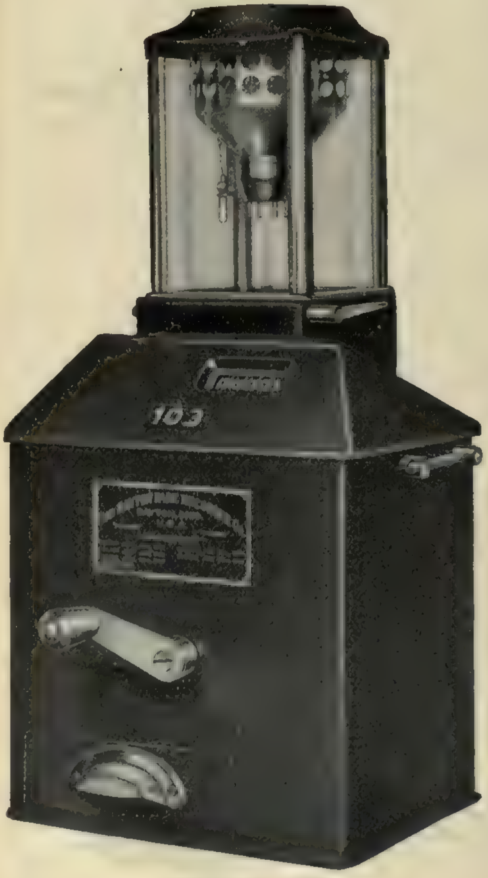
Recorder

FARE COLLECTION SYSTEM

Write us for
Catalog and
information



Sterling No. 16



Dayton No. 101

We devote our entire time to the manufacture of a complete line of:

REGISTERING and NON-REGISTERING FARE BOXES

CASH and TICKET FARE BOXES

STERLING SINGLE and DOUBLE FARE REGISTERS

CLASSIFIED, INDICATING and PRINTING FARE RECORDERS

for city and suburban cars.

GUARANTEED PERFECT in design, material and construction, and UNEQUALED for accuracy, reliability, and low maintenance cost.

The Dayton Fare Recorder Co.
Dayton, Ohio, U. S. A.

Here's a Really Useful Wiring Handbook

Croft's

Wiring for Light and Power

NOW READY

By **Terrell Croft**, Author "American Electricians' Handbook" and "Wiring of Finished Buildings."

426 *pages, flexible leather, pocket size,* $2.00 *net, postpaid.* Both the experienced wireman and the beginner will find this book valuable.

Every man who has ever had, or ever expects to have, anything to do with wiring or installation should own a copy.

To those who know Terrell Croft's "American Electricians' Handbook," or his "Wiring of Finished Buildings" or any of his other technical writings, little need be said about this book.

There was need of such a book. Every wireman has felt it.

There was a demand for a book that would enable both experienced and inexperienced wiremen to meet the requirements of the National Electrical Code, and at the same time, by logical arrangement and thorough indexing, tell you quickly what the Code requires and *why* wiring should be done in a given way.

The book is a big one. There are over 426 pages, bound in flexible, durable binding, pocket size.

Without hesitation or reservation, we announce that this is **a real Wiring Handbook.**

We Guarantee This Statement

We do not ask you to buy the book or to agree to buy it until you have examined it fully. You are under no obligation to buy it until you are satisfied that it will be of value to you.

You *must* be satisfied.

Fill out and mail the coupon today.

A Real Wiring Handbook

That fits the requirements of the National Code.

That conforms to the best American practice.

That is indexed so that you can find instantly the facts you need.

That is plainly worded so that anyone who can read English can understand it.

That is fully illustrated so that the right way to do a job can be grasped promptly.

That is, besides, a common sense, practical commentary on the National Electrical Code.

That tells how to install wiring and apparatus for practically all services, under practically all conditions.

That tells how to install these so as to be electrically safe and mechanically correct.

That explains why installations should be made in a given way.

McGRAW-HILL BOOK CO. INC.
239 WEST 39TH STREET, NEW YORK

LONDON: HILL PUBLISHING CO., LTD.
6 & 8 BOUVERIE ST., E.C.

Publishers of Books for Electric Railway Journal

FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc.,
239 West 39th St., New York, N. Y.

You may send me on 10 days' approval:

Croft—Wiring for Light and Power, $2.00 net.

I agree to pay for the book or return it postpaid within 10 days of receipt.

....I am a regular subscriber to the Electric Railway Journal.

....I am a member of A. I. E. E. or A. E. R. A.

(Signed) ....

(Address) ....

....

Reference ....E 5-19

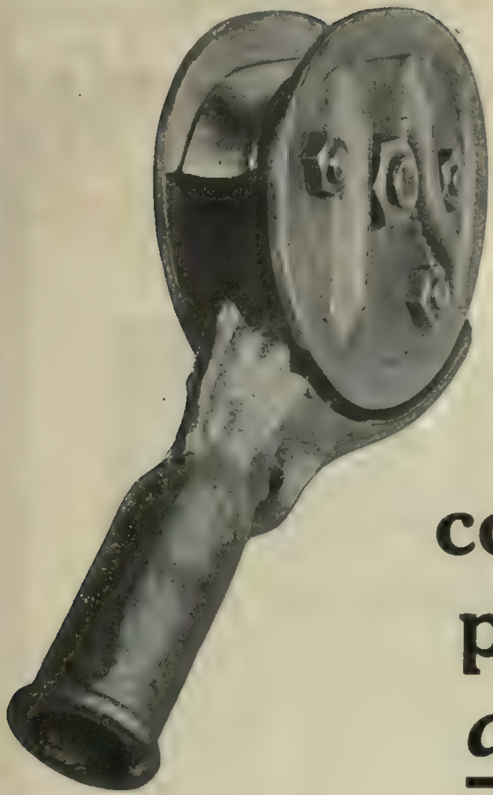
(Not required of subscribers to the Elec. Ry. Journal or members of A. I. E. E. or A. E. R. A. Books sent on approval to retail customers in the U. S. and Canada only.)

We Will Help You
AGREEMENT
BETWEEN THE
GALENA SIGNAL OIL COMPANY of Franklin, Pa.

When you make a Galena Contract, you unload your lubricating troubles on us, and we immediately supply you with **the best** oils for each service and take steps to eliminate all lubrication and allied troubles. Naturally, this results in a lower cost, and in any event our guarantee protects you.

Galena-Signal Oil Co.

Franklin, Pa.



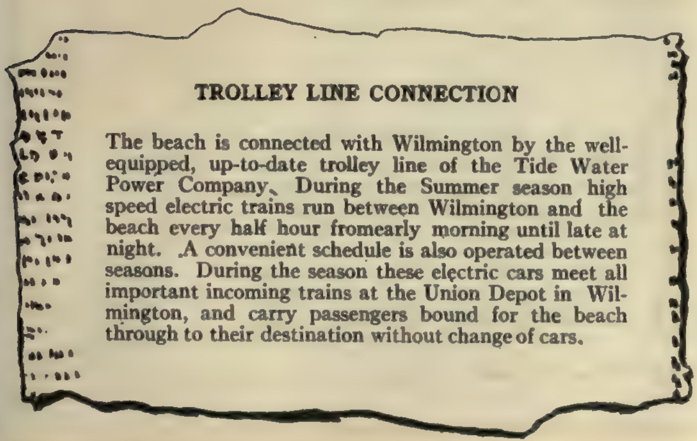
18,000 miles from Miller contact pieces *alone*

The Tide Water Power Co., Wilmington, N. C., began with 6 Miller Trolley Shoes. The Tide Water Power Co. placed an order last March for 42 Miller Trolley Shoes.

The Tide Water Power Co. has 18,000 miles worth of reasons for equipping both its city and interurban cars with Miller Trolley Shoes.

18,000 miles was the life obtained from the contacts alone—and the sides outlast several contacts.

Scores of Electric Railways have made the Miller Trolley Shoe standard because they have found it the one economical solution of their problems in current collection. Write *us* your current collecting troubles now.



TROLLEY LINE CONNECTION

The beach is connected with Wilmington by the well-equipped, up-to-date trolley line of the Tide Water Power Company. During the Summer season high speed electric trains run between Wilmington and the beach every half hour fromearly morning until late at night. A convenient schedule is also operated between seasons. During the season these electric cars meet all important incoming trains at the Union Depot in Wilmington, and carry passengers bound for the beach through to their destination without change of cars.

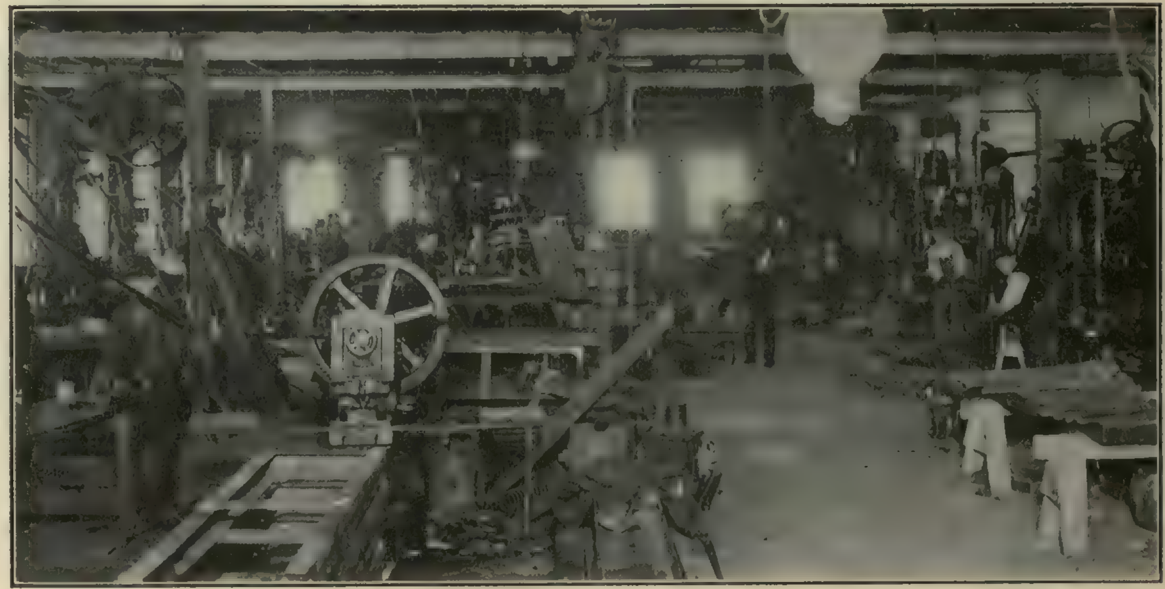
Miller Trolley Shoe Co.

53 State Street, Boston, Mass.

SALES REPRESENTATIVES

Alfred Connor, Denver, Col.
T. C. White & Co., St. Louis, Mo.
W. M. McClintock, St. Paul, Minn.
A. I. Sanger & Co., Cleveland, Ohio.
Holden & White, Inc., Chicago.
W. F. McKenney, Portland, Oregon.
F. F. Bodler, San Francisco, Cal.
S. I. Wailes, Los Angeles, Cal.

Most Any Metal Part a Car Needs Columbia Makes



This picture shows only a small part of our heavy metal-working department.

In the left foreground are the frames of metal **car doors** and in the center just behind the block and tackle are a batch of **gear cases.**

This is about the easiest way we know of to give you an idea of the Columbia range in car equipment.

TOOLS

- Armature and axle straighteners
- Armature shaft straighteners
- Armature buggies and stands
- Babbitting molds
- Banding and heading machines
- Car hoists
- Car replacers
- Coil taping machines for armature leads
- Coil winding machines
- Pinion pullers
- Pit jacks
- Signal or target switches
- Tension stands

CAR EQUIPMENT

- Armature and axle bearings
- Armature and field coils
- Bearings (axle and armature)
- Brush-holders and brush-holder springs
- Brake, door and other handles
- Brake forgings, riggings, etc.
- Car trimmings
- Commutators
- Controller handles
- Forgings of all kinds
- Gear cases (steel or mall. iron)
- Grid resistors
- Third-rail shoe-beams and accessories
- Trolley poles (steel) and wheels

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St., Brooklyn, N. Y.

W. R. Kerschner Co., Inc., N. Y. Holden & White, Inc., Chicago F. F. Bodler, San Francisco

Since
1907
Other Ry. Motor Gear Mf'rs.
have brought out a total of
22 grades of gearing
each one "as good as Tool Steel"
BUT
Cincinnati "Tool Steel" is still
the Standard of Quality

Collier Service

Produces the Cards That Pay

Nothing looks simpler than a completed car card, yet few things are more complex in the making.

There is first the nature of the article—Is it of a kind that can be profitably advertised in a card?

Second—Has straight text or art work proved most effective with this particular article?

Third—What colors and designs are most suitable?

Fourth—How often should the cards and the line of appeal be changed?

These problems are but a fraction of the many that arise in preparing a campaign for a Collier car advertiser.

Collier Service

is so extensive that each step receives the attention of a group of specialists. Their one thought—How to make car advertising bring the largest possible returns to the advertiser—maintains the value of this asset of the railway company.

Barron G. Collier
INCORPORATED

Candler Building
220 West 42nd Street, New York City

650 Rico Coasting Recorders ordered by The Kansas City Railways Company

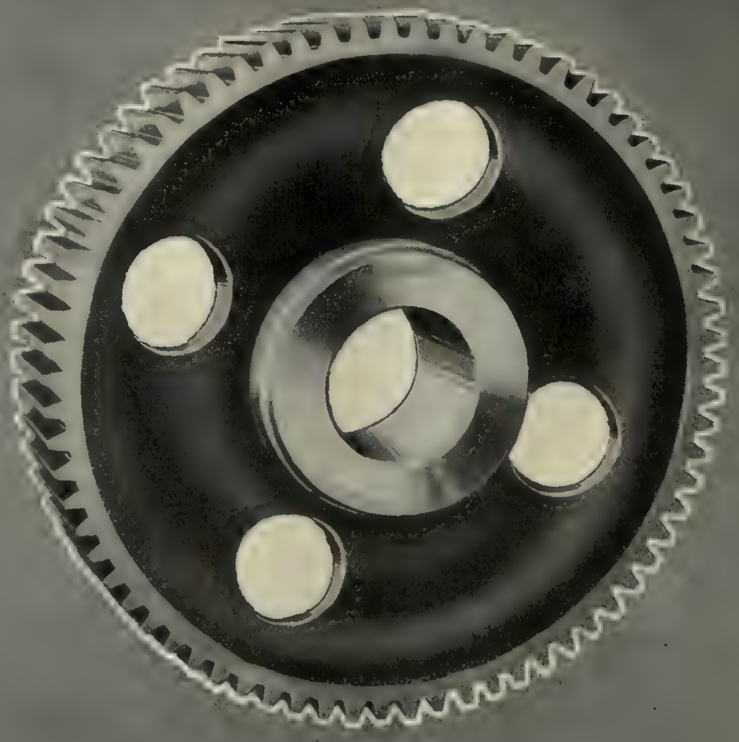
A thorough investigation of devices for securing operating efficiencies resulted in the Railways Company and the City Board of Control deciding to equip all cars with Rico Coasting Recorders.

Greater Savings—Greater Simplicity—More Economical Operation. Another instance of the approval of

The True Principle for Measuring Operating Efficiency

Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK



Sales of Grade M Gearing are still increasing rapidly

Practically all the progressive electric railways in the United States are now using the famous

"More Miles per Dollar Gearing"

General Electric Company

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio

Columbus, Ohio
*Dallas, Tex.
Dayton, Ohio
Denver, Colo.
†Detroit, Mich.
Des Moines, Iowa
Duluth, Minn.
Elmira, N. Y.
Erie, Pa.
*El Paso, Tex.
Fort Wayne, Ind.
Hartford, Conn.

General Office: Schenectady, N.Y.

ADDRESS NEAREST CITY

*Houston, Tex.
Indianapolis, Ind.
Jacksonville, Fla.
Joplin, Mo.
Kansas City, Mo.
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Los Angeles, Cal.
Louisville, Ky.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.

New Haven, Conn.
New Orleans, La.
New York, N. Y.
Niagara Falls, N. Y.
*OklahomaCity,Okla
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Providence, R. I.
Richmond, Va.
Rochester, N. Y.

St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal.
Schenectady, N. Y.
Seattle, Wash.
Spokane, Wash.
Springfield, Mass.
Syracuse, N. Y.
Toledo, Ohio
Washington, D. C.
Youngstown, Ohio.

*Southwest General Electric Company †General Electric Company of Michigan
For Canadian Business refer to Canadian General Electric Company, Ltd., Toronto, Ont.
General Foreign Sales Offices, Schenectady, N. Y.; 30 Church St., New York City; 83 Cannon St., London, E. C., England. 6861

Electric Railway Journal

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Increased Fare Movement Is Widening

WITH the appointment of a special committee of the New York Electric Railway Association to consider ways and means of increasing the fares on street railways in New York State, and with the informal presentation of their case to both the First and Second District Commissions this week, the movement for a general increase in fares throughout the State has received a decided impetus. Nor is this the whole of our story this week. The Pennsylvania Street Railway Association has authorized the appointment of a committee of five to consider the desirability of concerted action on the subject of higher fares in that State. The tendency is encouraging. Of all industries in the country electric railways have probably needed additional revenue the longest and the most, but it is to be hoped that their condition will be bettered in the near future. Now is the time for real teamwork on the part of all electric railways.

A CHANCE TO IMPROVE OPERATING CONDITIONS Although there may be differences of opinion on the desirability of drastic retrenchment for the nation's industries as a means for meeting the burdens of war, there can be no doubt that anything that adds to real efficiency should be encouraged. For most industries this suggestion would, of course, be a particularly unnecessary platitude, but in the case of electric railways there are several opportunities to improve effectiveness of operation which are thoroughly understood but which generally have not been introduced because of the public's inertia or unreasoning opposition. Among them may be cited the skip stop plan, which, in any one of its various methods of application, permits faster schedules and thus increases the amount of service that may be provided with any given amount of equipment. There are also the use of light-weight, one-man cars for lines having thin traffic, the readjustment of factory closing hours to distribute the evening peak, and the free extension of the turn-back car principle to reduce light-load car-mileage. All of these have been demonstrated to be effective in improving efficiency and thus conserving the energies of both labor and capital—and any conservation of our national energy will give us just so much more strength for the gigantic task now facing us. The public is, to-day, beginning to realize this, and if it has not an open mind now it never will have one. The present, therefore, is the psychological moment to ask for public co-operation in regard to improved methods of operation, and should public attention be called again to the fact that means for increasing efficiency (such as those just mentioned) may be promptly introduced if only each community will withdraw its arbitrary opposition, we believe that public opinion will view the matter in a new and reasonable light.

HOW THE COMMISSIONS CAN HELP The duty of commissions is to secure the most efficient operation of public utilities. This is as true in war times as in peace times, if not more so. Public utilities are of such vital importance to the nation that their services must be maintained, and if under war conditions added burdens of operation are imposed, there is all the more reason why public service commissions should handle their work in a constructive way. The nation needs to have its utilities operating in the fullness of their powers, and the commissions must be expected to do their bit in bringing this about. Can the commissions help in the present situation? They can, and in many ways besides that of treating in a broad-minded way the immediate need of electric railways for higher revenues, as discussed elsewhere. They can help to retain in service an adequate number of employees by presenting the needs of the railways to the military authorities. They can aid in securing proper recognition from the national fuel committee in regard to the movement of utility coal. They can co-operate with the utilities to make the public see the advisability of such economies as those noted in the previous paragraph. These are a few of the problems in the solution of which the commissions should now be actively engaged, looking toward the more efficient operation of the great national industrial machine which must be the backbone of any successful front presented against the enemy.

WAGES, FARES AND DIVIDENDS An award like that of the Middlesex & Boston arbitration board, abstracted elsewhere in this issue, which increases wages with full recognition that by such action the stockholders will be stripped of substantially all, if not quite all, of their returns from their investment at the present rate of fare, is a challenge which the public itself must heed in the near future. The question is in reality very simple. No one but the patrons of a street railway meets the cost of its transportation service, and that cost must include a fair return upon the investment if the service is to keep pace with the demands of the times. This is necessary because no equivalent for street railway service has yet been discovered, sporadic jitney competition to the contrary notwithstanding. The whole fare problem is merely a question in arithmetic. All costs must be met by the public, either in the form of adequate compensation to private management or as increased taxation under public ownership. Even under public ownership the expenses must be met, and it is "up to" the public to decide whether it will support initiative and ability as associated with private management under public regulation, or will turn its utilities over to the tender mercies of the professional politician and put up with that stagnation of progress which is the great blight upon governmental efforts to carry on industry.

COAL PRICES AND POWER RATES For many years, previous to the great war, the unit costs of different kinds of coal, like the unit costs of rail steel, were, as the laws of the Medes and Persians, fixed quantities or practically so. The variations in selling price were so small that they were neglected alike by power companies and public service commissions in matters of rate fixing and rate adjustment. But like about everything else this nice uniformity of price has been rudely upset by the war, for reasons only too obvious to the harassed purchasing agent. Since that portion of the cost of energy at the switchboard which is chargeable to fuel varies from 25 to 50 per cent, depending on size of plant, load factor, and location of plant with respect to source of fuel supply, the fuel question even in normal times is a most important one to those companies engaged in power generation. So far as the railway industry is concerned those companies engaged in power sales work are, of course, most directly affected by the fuel situation. A 50 per cent increase in fuel cost will, on the basis of the above figures, increase the cost of energy from 12 to 25 per cent; an increase sufficient to wipe out the margin of profit in most cases. The effect of high fuel cost on earnings has been forcefully pointed out in several recently issued annual reports of large power companies. As illustrative of the protective measures being used by some companies may be mentioned the power contracts of the New York Municipal Railway Corporation described in a recent issue of this paper. In these contracts the cost of power is made contingent on the cost of fuel. At present the outlook for a plentiful supply of cheap fuel is not very encouraging, and as rate increases and adjustments are both difficult and costly to secure, the fixing of a rate upon a base price for fuel and the inclusion of a contingent fuel cost clause in power rate schedules and contracts are wise precautions.

THE FINANCIAL VALUE OF MASTER MECHANICS

In recent editorials entitled "Better Pay for the Master Mechanic" and "The Master Mechanic's Corner" we have pointed out in general terms how undervalued that functionary is. Not long ago we were wired to recommend a master mechanic for a twenty-five car road at the dazzling wage of $100 a month. We used the mail to cool the fevered inquirer with the reply that $100 a month was now being spurned by most anybody who could detect the difference between a lathe and a boring mill.

From generalities on this subject, we may now pass to actual figures which show what a particular master mechanic may be worth. A certain man has been in charge of a property since 1911, and this is how he compares with his predecessor: The former man spent $28,650 per month to maintain cars which made 892,000 car-miles per month in 1910; the present man has successively lowered maintenance until it was only $14,000 per month in 1916 for 1,030,000 car-miles. If the 1910 rate per car-mile prevailed, the maintenance in 1916 would have been $19,063 more per month than it actually was—a tidy saving and all the more remarkable in view of the great increase in material costs from 1910 to 1916. Yet the cars look finer than ever, as indicated by an increase in painting (part of maintenance) from $750 to $1,625 a month.

Of course, this master mechanic has done more than save money on maintenance. He has reduced pull-ins to a minimum, thereby satisfying the riding public and giving his company 33 cents gross revenue for every extra car-mile due to uninterrupted service. Finally, in spite of extremely hilly conditions, he has produced a low-floor car that is promoting traffic and reducing platform accidents. We should say this master mechanic is worth about $50,000 a year more than the man he replaced. If not, why not?

THE PROSPECT FOR ADVANCEMENT IN A JOB

Having proved by actual figures that a good master mechanic is cheap at any reasonable price, we wish to call attention to another phase of the matter, namely that here as in all occupations it is the future rather than the present which concerns the ambitious employee. Preparation for the future consists in growing in the present job so that it is sooner or later outgrown. Only thus can the best present work be done, for the man who is not advancing is going backward. There is no such thing as standing still. It is, therefore, the duty of the electric railway industry to place before the men in the mechanical department, as elsewhere, sufficient of future promise to furnish the incentive for the best effort. The question may be asked "Why single out the mechanical department for comment, when the same principles apply elsewhere?" The answer is that in our opinion the mechanical department is peculiarly subject to limitations in pay and opportunity for various reasons, but whether this is so or not, it is obviously to the interest of every company first to get into the shops men who are capable of development, and then to furnish the stimulus for development.

But there is another side to this question. The mechanical department man who aspires to be a general manager must be thinking about transportation problems in a large way. The head of a technical department of an important electric railway system said recently to the writer: "I don't expect always to be only an engineer." He is presumably preparing himself for broader responsibilities by interesting himself in broader problems. So, in the shop, there are activities more important even than designing ingenious jigs for babbitting bearings or making pinion pullers from iron reclaimed from the scrap pile. The manager who is not delighted to see his equipment men show signs of administrative talent and broad-gage appreciation of the big problems of the industry is not the manager of the future. He and the head of his mechanical department should work hand-in-hand to solve these problems, and if they are so doing, the latter will not be looking for another job with more future in it.

DESTRUCTIVE POSTAGE TAXATION

One of the clauses in the pending war tax bill provides for a zone system of postage for second-class mail matter, with rates varying from 2 cents per pound for the first zone to 6 cents a pound for places in the eighth zone. The average rate for publications of general circulation, printed on the Atlantic seaboard, would be about 4 cents, as against 1 cent a pound at present.

We believe that all publications are anxious to pay their proportion of taxes to the government in the present emergency. This is certainly the attitude of the ELECTRIC RAILWAY JOURNAL. But the proposed rate is most objectionable from several points of view. In the first place it means so radical an increase in a very large item of publishing expense as seriously to affect the publishing industry, since all existing subscriptions and advertising rates are naturally based on the present charge. The net result will probably be periodicals so crippled that there would be little if any increase in gross or net postage income to the government, as most of the post-office department expenses would go on as heretofore. It would mean also that the government was reducing the best facilities at its disposal for instructing the various industries of the steps they should take to assist in the national defense.

A second objection to the plan as proposed is that it tends to sectionalize the country at a time when national unity in thought and action is most important. Moreover, in the case of technical and trade papers, it would penalize those subscribers most distant from the centers of publication by making it more expensive for them to keep in touch with the economic developments in their line of business. The increase in postage on a year's subscription to this paper in the eighth zone, for instance, would be approximately $2.25, the eighth zone including all points 1800 miles or more from New York. The zone system for second-class postage has been suggested before but always has been discarded, and it always should be discarded in the interests of nationality and also because it is based on the wrong theory that the largest item in the cost of the mail service is the railroad transportation instead of the terminal charges of sorting and distribution.

In the third place, the proposed increase runs counter to the plan that the expenses of the war should be paid for out of profits and not out of capital. Howard E. Coffin, of the Council of National Defense, recently said, and truly, "We must have successful industries, if successful tax levies are to be received." But a high tax on methods of production of trade and technical papers will not only prevent the publishers of those papers from having profits on which to be taxed, but, through the reduced service which they will be forced to render, will adversely affect the industries which they serve. Subscribers to this paper can well make their protest heard in Washington.

NEW ERA FOR ELECTRIC RAILWAY INDUSTRY

The electric railways of New York State have at last taken the plunge magnificent. They have determined to cast aside all minor misgivings and to present themselves unreservedly at the bar of public opinion. Some of the companies have been timid about this, others, acquiescent; others, hopeful; and others, confident. We ourselves are absolutely sure that the companies have done a wise thing and that the issue will justify their wisdom.

The profoundly sagacious feature of the proposed policy is to go first directly to the people. As was stated specifically by Mr. Shonts in his published statement to the people of New York this week, it is the purpose of the company to go formally before the Public Service Commission later on for consideration of the situation, but preliminary to that it is the company's purpose to "inform and consult public opinion." That is fine. Mr. Shonts addressed a letter to the presidents of the principal commercial and taxpayers' organizations in the city of New York inviting them to examine into the facts for themselves and report their conclusions to their own members, and through them to the public. This will make possible an organized and spontaneous development of public opinion in advance of definite consideration of the subject by the Public Service Commission itself.

The committees representing the electric railways of the State have had conferences with the Public Service Commissions in both districts of New York with a view to settling upon a procedure whereby the issue may be presented definitely and determined upon as speedily as possible. But we understand it is the purpose of all these companies to invite investigation and consideration by local organs of public opinion in order that the people themselves may determine whether or not relief for these companies is not justified, not alone from the point of view of fairness to investors but from the point of view of the interests of the public service itself.

The people must realize that they must provide their street railways not only with sufficient money merely to keep alive but to enable them to keep up with the progress of the art. Street railways have gone through a process of evolution. First, there was the horse car, then, the cable lines, the overhead trolley and the underground trolley. The types of cars are undergoing evolution, always toward greater comfort and convenience for the public. This progress of the art must be paid for; it must be provided for out of the earnings of the company. That is true of companies which are not extending their service. Of course, those that are building new lines in new districts must have the new capital with which to do so. Otherwise the public is sure to suffer. These facts should be made clear in every community where electric railways operate.

As was stated by J. K. Choate, chairman of the committee of the New York Association on ways and means to increase revenues, the method of obtaining the additional money will have to be according to local needs. In New York City, for example, the network of lines makes the obvious solution of the problem a charge for transfers. The lines up-State, however, will probably have to get their relief, if they obtain any real relief at all, from a 6 or 7-cent fare. Buffalo very likely will have to deal with the problem much as New York does. But the essential need is to obtain more money, and the safe and only road toward doing that is through persuading the public as to the reasonableness of the policy proposed.

VALUATION DELAY DANGEROUS

Companies should make it clear to their constituencies that a solution of this reserve problem cannot be delayed while a process of "valuation" is gone through with the properties. Valuations are all very well, but the vital question now is whether or not the value of the service rendered is not greater than the cost of rendering service. In the steam railroad business it is a fundamental principle, justified by long years of experience, that the service should be paid for with some regard to its value. Perhaps the stock of some of the companies is "watered"; perhaps there have been unsound methods in their past finance. But this is the fact which the public faces now: *its present standard of service is threatened.* Will the danger to that service be averted now by a slight increase in fares or forcing the companies into receivers' hands, or so close to receiverships that the standard of service will necessarily suffer? That is the phase of the matter which should be presented to the public in a practical and very present form.

The new federal tariff bill expects to raise the rate on ordinary letter postage from 2 to 3 cents. Nothing could be more revolutionary than that. It is justified by the expenses to which the government has been put under the necessities of war. The expenses of the government are directly related to the war. But the public should face the fact very clearly that the vastly increased expense to which street railways as well as other lines of business have been put is due just as much to the war as are the expenses of the government, the only difference being that the effect upon the street railways is indirect while that upon the government is direct. For example, the reason why the price of coal is so high is because there has been such an enormous demand for coal in Europe, because there has been such a great development of industry in this country to supply the needs of Europe for supplies of all kinds and because there is a shortage of labor in the coal mines. The price of coal has got beyond all bounds and affects the street railways very directly. When the electric railway companies, therefore, pay the very high price of coal they are, in a sense, paying the expenses of the war just as much as the government which directly buys munitions to ship to the front.

PUBLIC WANTS TO BE FAIR

This question of raising the basic fare, so long discussed and from which electric railway men have recoiled as from a threatening serpent, is now at last definitely before the people. We are more than delighted that it is to be presented to the people, and that the people themselves are to be requested to express their views for the purpose of guiding the action of the public service commissions. Obviously, if the people feel it to be right and wish to pay an increased fare to ride on their street railways, no public service commission in the world would attempt to deny them that privilege. On the other hand, public service commissions could not be expected to face the storm of public protest and criticism and award to companies the right to charge an increased fare, if the public itself felt that the increase was unreasonable and unwarranted.

We have the utmost confidence in the American people. We have never known any subject to be presented to them and fully discussed by them but, in the end, it was settled fairly and squarely. The people will not submit to be humbugged; they will not submit to have something put over them. But they do want to be fair and square, and we are certain they will be so in this case. The electric railway industry is to be congratulated and felicitated upon the way in which it has gone at this matter, and we have every confidence in predicting the result will be a triumphant vindication of the methods which are being pursued. The electric railway industry through this action of the companies in New York, has, we believe, entered upon a new era.

"THE manufacturer can raise his price to keep pace with his costs. It is what every private enterprise has been doing. Every item that enters into the cost of living is increasing. Street railway costs are mounting in a faster ratio than any other, yet our prices have been kept at the same level."—J. K. CHOATE, *before the New York Public Service Commission, Second District, May* 16, 1917.

Interurban Cars with Off-Set Central Vestibules

The Jamestown, Westfield & Northwestern Railroad Has Placed in Service Some High-Speed Cars Having Central Entrance Vestibules to Separate Passenger and Smoking Compartments—Split-Field Motors and Multiple-Unit Control Are Used to Save Weight

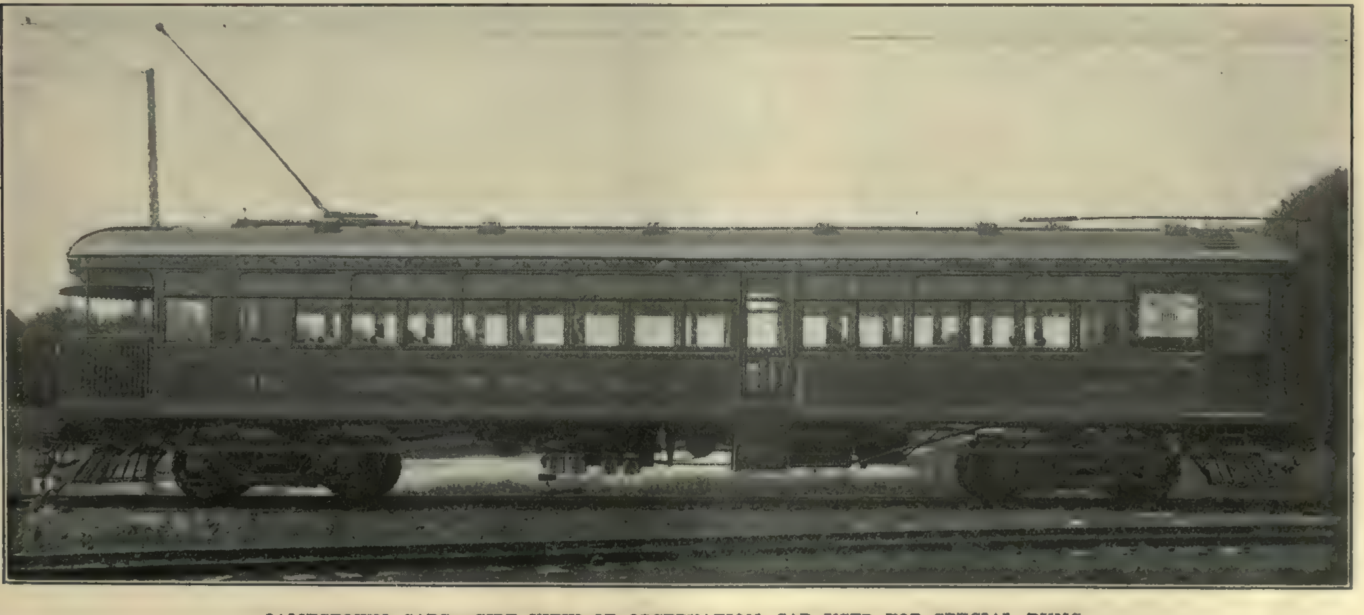
FOUR high-speed interurban cars have been placed in service by the Jamestown, Westfield & Northwestern Railroad that possess several notable features, among which the most prominent is the provision of offset central vestibules 3 ft. wide without the use of drop-siding to support the steps. Primarily the centrally located entrances were adopted to separate definitely the smoking and main passenger compartments, thus avoiding any need for women passengers to go through the section occupied by smokers—an undesirable condition that of late is being given continually increasing recognition. Another feature appears in the facilities provided for giving passengers an unrestricted view of passing scenery by the installation of glass in all bulkheads and even at the rear of the motormen's cabs.

The traffic that is served by the cars is very largely made up of through travel from Jamestown, N. Y., to connect with the trunk line of the New York Central Railroad, the schedule time for limited runs over the 32-mile route being fifty-nine minutes while the local schedule calls for one hour and fourteen minutes. Relatively few stops are made, and hence the objectionable features of the single narrow vestibule, whereby complete unloading must take place before passengers can board the car, are minimized in effect. On the other hand, the design permits the seating capacity of the cars to be materially increased, and this feature is considered by G. L. Maltby, superintendent Jamestown, Westfield & Northwestern Railroad, who designed the cars, to be of utmost importance, since the major part of the company's traffic comes within a period of only three months and all equipment must be worked to the limit of its effectiveness. The gap in the car side necessitated by the interior-type steps has been introduced without the need for drop siding by cutting out a section of the side sills and transferring the load normally carried by it to a pair of heavily reinforced intermediate sills.

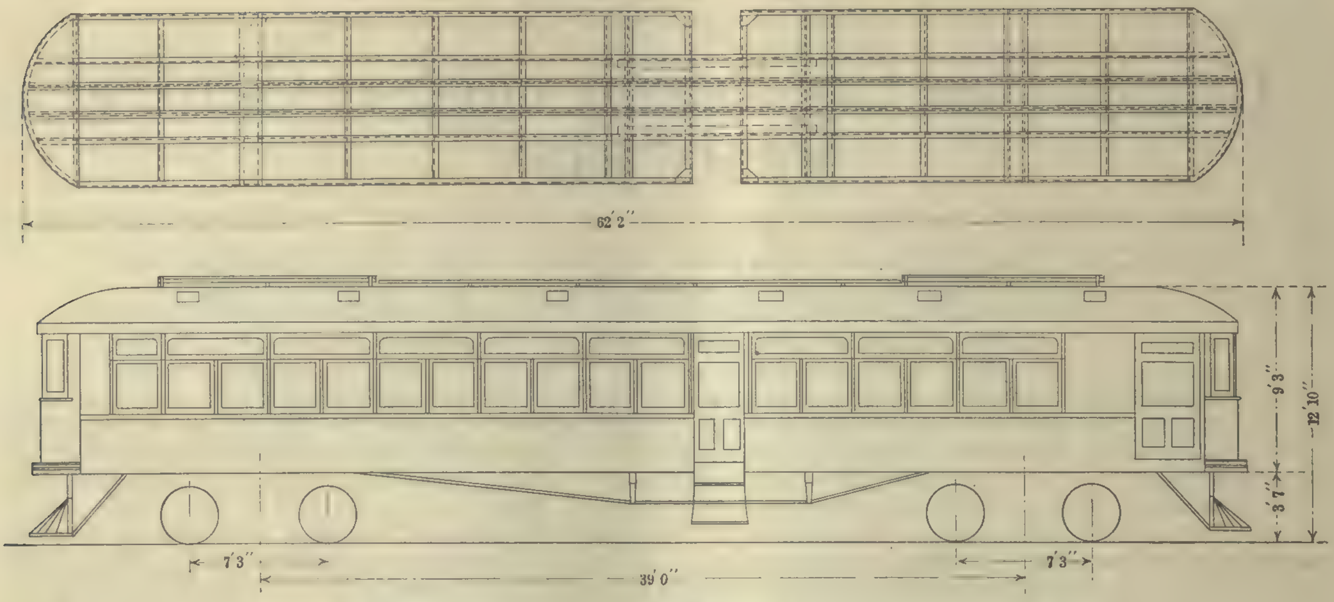
Another feature of the cars is the use of Westinghouse 547-A motors with "split" fields. This design was adopted in spite of the infrequent stops on the schedule with the idea of saving in motor size and weight, the motors actually installed having an hourly capacity of about 85 hp., whereas straight series motors to maintain the schedule over the rolling country served by the road would have had to be of about 105 hp. rating. At full speed on level track the motor equipment gives a speed of 50 m.p.h. and it will give greatly increased torque at a speed of 42 m.p.h. when operated on the next lower running point. Indirect control also was adopted to save weight and to keep all of the heavy current-breaking apparatus below the car floor.

One of the cars has been provided with an observation platform that can be paneled in during cold weather. This car was designed especially for a limited run that makes connection with a favorite train on the New York Central Railroad. Owing to the absence of readily accessible wyes at the terminals, and the necessity for operating this car single end, it is not used on other runs, and therefore has been provided with a more elaborate interior finish than the three other cars. Aside from this feature, however, all four cars are exactly alike, being provided with baggage compartments at one end, in addition to the main passenger and smoking compartments, to serve the needs of the many traveling salesmen who patronize the line.

The most interesting feature of the construction is



JAMESTOWN CARS—SIDE VIEW OF OBSERVATION CAR USED FOR SPECIAL RUNS



JAMESTOWN CARS—ELEVATION AND FLOOR-FRAMING PLAN OF INTERURBAN CAR

the framing arrangement at the gap in the side necessitated by the centrally located entrance. Strength at this point is provided by the use of intermediate sills made from 8-in., 11-lb. channels that are reinforced at the vestibule by having lengths of 8-in. channel riveted back to back with the intermediate sills and extending for the length between needle beams about 9 ft. In addition, the intermediate sills are trussed with 1¾-in. truss rods having a 24-in. drop. The needle beams are of 8-in., 18-lb. channels, and they serve to distribute part of the load between the intermediate sills and the side sills, which are 6-in., 8-lb. channel with the flanges turned inward. Step sills at the sides of the vestibule also extend across the car, these being made from 8-in., 11-lb. channels. The center sills are made of 8-in., 18-lb. I-beams, and they have cover plates 54 in. wide extending in one length from one needle beam to the other, the thickness being ⅛ in.

Aside from the construction at this point, the design is not unusual, following the general practice of the St. Louis Car Company, the builder of the car bodies. The side sheathing is made from 36-in. x ⅛-in. steel with a 3-in. x ⅜-in. belt rail at the top, over which is a belt-rail cover and sash rest of ⅛-in. pressing. The side posts are made from 2-in. x 3-in. tees extending from side sill to side sill in one piece and forming the carlines. The end posts are 2½-in. x 3-in. tees, while the corner posts, baggage door posts, motorman's door post and vestibule door post are of ash. To serve in place of crown pieces, and to keep the sills from relative longitudinal movement, a steel plate ⅛ in. thick is riveted to the flanges of the bumpers and sills and extends for 30 in. back from each end of the car, the bumpers being 8-in. channels with the flanges turned inward. The body bolster is of the built-up type, and there are bolster cross sills of 8-in. channel on either side of it. Plates of 3-in. x 2-in. x ¼-in. angle are provided near the eaves, and there is a letterboard of No. 14 sheet steel. The interior finish is of wood, but there is a layer of insulating material composed of ½-in. flaxlinum cemented to the inside of the side sheathing.

The flooring rests upon cross sills of 5-in. channel spaced about 4 ft. 6 in. apart, and it is built up of a course of No. 16 sheet steel that covers the entire bottom, together with ¾-in. fillers bolted to sills and floor sheets, one course of building paper, one course of 13/16-in. flat grain yellow pine tongued-and-grooved floor board, and one course of battleship linoleum. In

JAMESTOWN CARS—THREE-COMPARTMENT INTERURBAN CAR WITH OFFSET CENTRAL VESTIBULE the baggage room the floor is made of 1/8-in. diamond-pattern steel riveted to the tops of the sills, an insulation of 1-in. mineral wool being provided between the floor plate and a No. 16 sheet steel subfloor, which is set 1 in. below the top of the sills.

The roof is covered with 7/16-in. narrow-width, tongued-and-grooved poplar that is fastened to furring strips on the carlines. This surface in turn is covered with No. 8 cotton duck fastened with molding at the eaves. Galvanized-iron gutters are installed on the roof over the center-entrance doors and over the motorman's door.

At the center doors the steps are of steel and the treads are installed so that there is an opening of 1 in. between the riser and the back edge of the tread, both step treads and edges of vestibule floor being fitted with Mason safety treads 6 in. wide. At the motorman's side door and at the baggage door on the opposite side of the car folding steps are installed to give access to the roof. The usual wrought-iron sill steps are installed at the baggage doors and at the motorman's cab door.

The general dimensions and weights for the car are as follows:

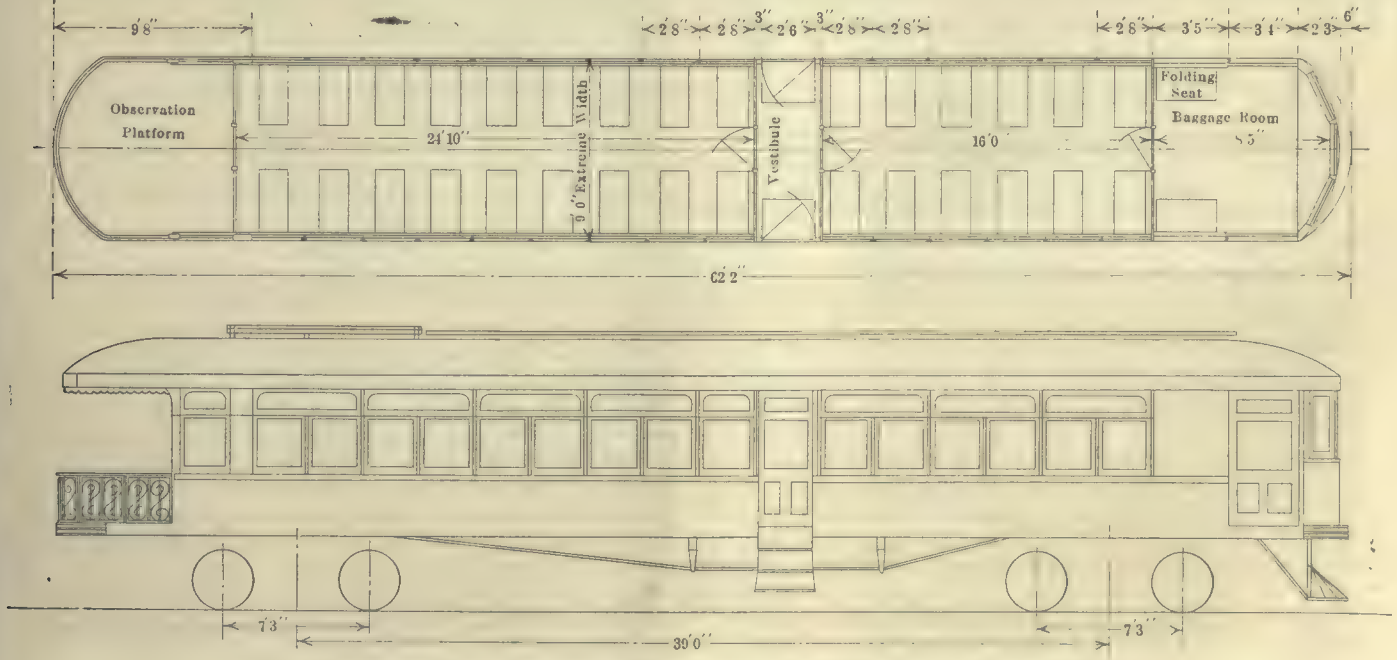
Length over bumpers	62 ft. 2 in.
Length of baggage compartment	9 ft.
Length of smoking compartment	15 ft. 11 in.
Length of main passenger compartment	33 ft. 5 in.
Length of central vestibule	3 ft.
Side post centers	2 ft. 8 in.
Extreme width	9 ft.
Length between truck centers	39 ft.
Truck wheelbase	7 ft. 3 in.
Weight of car body	43,420 lb.
Weight of trucks	28,000 lb.
Weight of electrical equipment	14,625 lb.
Weight of air brakes	2,355 lb.
Total weight complete	88,400 lb.

INTERIOR ARRANGEMENT AND EQUIPMENT

An unusually broad seat is provided, since the width of aisle is 22 in. and the over-all width of the car 9 ft. The seats are of the reversible type in both the standard type cars and the observation car, excepting, of course, the stationary seats at the ends of both compartments and two folding seats that are located in the baggage compartment. The latter compartment serves to separate the motorman from the body of the car and no cab is provided at that end. On the three standard type cars, however, a cab is installed at the opposite end of the car in the main passenger compartment, since these three cars normally operate in both directions. The cab, it may be said, is provided with glazed doors, giving entrance into the passenger compartment and also to the outside of the car, and it has a large stationary sash in the back wall, permitting a full view ahead by passengers in the compartment behind the cab.

JAMESTOWN CARS—INTERIOR VIEW OF PASSENGER COMPARTMENT, SHOWING FULLY GLAZED MOTORMAN'S COMPARTMENT IN RIGHT-HAND CORNER

As before mentioned, the vestibule is 3 ft. in length and extends across the entire width of the car, being provided with trapdoors and steps at both sides. The bulkheads on either side of the vestibule are made of mahogany 1 1/8 in. thick, with flush panels, and they are provided with single swinging doors and with glazed stationary sash on either side of the swinging doors. The same provision for observation in every direction



JAMESTOWN CARS—ELEVATION AND SEATING PLAN OF OBSERVATION CAR by passengers appears in the use of glazed sash in the bulkhead for the baggage compartment.

Including the folding seats in the baggage room, the interurban car seats seventy-two passengers, while the observation car seats sixty-four. However, the latter figure does not include any allowance for space on the observation platform, upon which folding chairs are used.

Features of the interior equipment include the use of electric heaters with Consolidated Car Heating Company's thermostat control, one heater being installed under each cross seat. Ventilation is provided through twelve Peerless ventilators installed on the roof of the car and equipped with round brass registers in the headlining, which is ¼-in. Neva-Split.

A mahogany interior finish is used in the passenger, smoking and vestibule compartments, including all sash, doors, moldings, sash rests, frieze boards, etc. In the baggage compartment the finish is of natural ash. The seat coverings are of black leather on the standard cars and green leather on the observation car, all curtains being made of Pantasote. For the wainscoting a finish of ¼-in. Neva-Split extends from the seat-rest angle to the sash rest. Below the seat-rest angle, the finish is of No. 16 steel, and a 3-in. radius sanitary cove is provided at the floor line.

ELECTRICAL AND MECHANICAL EQUIPMENT

Each car, as mentioned before, is equipped with a quadruple equipment of Westinghouse No. 547-A, 600-volt, field-control motors and standard Westinghouse HL-type control. The motors have a nominal or one-hour rating of 118 amp. at 600 volts, approximating 85 hp., the continuous rating being 72 amp. at 600 volts. This motor was designed to meet the previously outlined service requirements of sustained speed over rolling country with relatively few stops, such as exist on the Jamestown, Westfield & Northwestern Railroad, and the weight of the motor complete is only 3100 lb.

The main field coils are wound in accordance with what the manufacturer terms the "split-field" arrangement. In effect this provides for two field windings per pole, both of which are connected in series during acceleration. As a result there is provided the highest possible tractive effort and low-current consumption at low speed, with a consequent economy in operation and freedom from high peaks in the load. When a portion of the field winding is cut out, the characteristics of the motor are modified just as if the gear ratio had been instantaneously changed.

The use of an indirect type of control was practically inevitable, because of the fact that the present-day forms of such apparatus have demonstrated themselves to be of far greater reliability and of very nearly equal simplicity to controllers of the platform type. In addition, the removal of apparatus carrying heavy currents from the platform, as well as the possibility of train operation, made its use of decided importance for the installation under discussion.

Westinghouse air brakes of the AMM type have been installed, this design providing for quick-service application, graduated release and high pressure in emergency, with the addition of the independent use of the straight-air feature for single-car operation. The control, however, is contained wholly within one brake valve and the car is ready at all times for either single-car or train service. The body brakes are designed to give a braking power of 90 per cent of the light weight of the car.

Other equipment that is installed includes Tomlinson M.C.B. couplers as well as the railway company's standard portable drawbars. The headlights are of the Crouse-Hinds luminous-arc type, arranged for removal from one end of the car to the other. A switchboard is located in a small steel switch cabinet in the baggage room, this being of such size that it accommodates all switches except those for the headlights and air compressor. The latter switches are located on the ceiling in a position convenient to the motorman. The fare register is of the International double-faced round type, designed for recording cash and ticket fares.

The cars are mounted on Baldwin high-speed interurban trucks with a wheelbase of 87 in. and a carrying capacity of 35,000 lb. on each center plate. They are of the equalized, pedestal type, with forged side frames, angle-iron end frames and channel transoms that are reinforced with substantial corner gussets, the latter acting at the transom as guides for the brake levers. The objectionable nosing so often found in high-speed service has been reduced to a minimum by a special arrangement of short and long swing links recently developed by the builders. Throughout the foundation brake rigging on the trucks has been bushed with case-hardened bushings and fitted with case-hardened bolts, spring washers and castellated nuts, making the brake practically noiseless in operation and providing means for economical replacement of parts that have been affected by wear. The trucks are provided with 36-in. wheels, 5-in. x 9-in. journals, cast-steel bolsters, and inside-hung motors and brakes.

P. S. R. A. Discusses War Problems and Increased Fares

Spring Meeting Was Devoted to Informal Talks—Important Resolutions and an Amendment to the Constitution to Provide for Holding but One Meeting Annually Were Passed

ABOUT sixty members attended the spring meeting of the Pennsylvania Street Railway Association held at the Harrisburg (Pa.) Club on May 11. On account of the present national crisis the usual set program with prepared papers was replaced by an informal discussion covering the two general subjects; first, war-time duties of electric railways including the economies and precautions which are advisable, and, second, increased fares. The war subject formed the morning topic of discussion, luncheon was served at 2 p. m., and then after talking over war-time economies and labor problems the question of increased fares was discussed until the meeting adjourned at 5.30 p. m.

E. B. Burritt, representing the American Association, was present at the meeting. He included in his remarks a brief description of the way in which the American Association was co-operating with the national government by collecting data regarding electric railways and maps of their lines.

RESOLUTIONS PASSED BY THE ASSOCIATION

The association took formal action on several matters. The amendment to the constitution presented at the Philadelphia meeting was carried. This provides that the regular meeting of the association shall be held annually during the month of May or June at such time and place as may be determined by the executive committee. The action taken at the last meeting of the executive committee, offering the services of the Pennsylvania Street Railway Association in co-operating with the Council of National Defense in the present national crisis was approved. It was voted to send telegrams to the Pennsylvania congressmen and senators in the national Legislature, and to the members of the ways and means committee of the House and the finance committee of the Senate, urging that motor trucks and buses doing a passenger or freight business be included in the same schedule of taxation as the steam and electric lines. In connection with the subject of increased fares a motion was made and carried that a committee of five be appointed to take up the question of increased fares on the street railway lines of Pennsylvania. It was understood that this committee would investigate the desirability of the railways taking united action before the Public Service Commission on this subject. Letters will probably be sent out by the secretary of the association to member companies asking their opinion on this subject, and when the committee has crystallized the ideas of the railways a special meeting of the executives of the member companies may be called to authorize further action.

WAR NECESSITATES GUARDING OF PROPERTY

On the subject of the special war-time precautions different members told of what their railways had done. The precautions consisted chiefly in guarding the company's property by special constables and deputy sheriffs; placing barbed wire fencing around the power houses, carhouses and shops, and reducing the number of entrances to such property; screening of powerhouse and shop windows; using additional tie lines between power stations, and in other ways providing for an emergency source of power. The companies operating through several counties told of the difficulty encountered because of the fact that the deputy sheriffs and constables could have jurisdiction only in one county. Another disadvantage of having this class of guards was that they were sworn in by the sheriff, who was responsible for any overt act which they might commit. When the guards were used on railways the sheriff held the railway responsible. The law provides that the guards cannot use their guns except in cases where their life is in danger or where the trespasser is detected in committing a felony. It was pointed out that it was therefore necessary to give careful instructions to the guards as to the handling of their firearms. The use of shotguns instead of rifles was recommended because of the fact that the bullets do not carry as far and the danger in hitting innocent persons is not so great. The companies reported that the government was not furnishing the electric railways with any guards. This left it up to the railways to furnish their own men for this duty. It was pointed out that Germany has not yet recognized a state of war with the United States, and when she does so the number of acts against the public utilities may be greatly increased. The railways should, therefore, be continually on their guard and not be careless because no acts against their property have been committed so far.

PAY FOR EMPLOYEES IN MILITARY SERVICE

It was reported that the United States Chamber of Commerce had investigated the subject as to whether or not the employers should pay the wages of the men who enlisted and take care of the dependents at home. The decision was that the government and not the employers should bear this burden. Instances were cited in which the railways were paying full wages of the men and promising to give them their jobs when they return. One of the embarrassments of the latter promise was that several men might hold the same position successively before leaving for the front. The question of who should receive the position at the end of the war would be a difficult one to solve.

One railway man read the following announcement as a tentative definition of the company's war-time policy:

"The folly of crippling local transportation facilities of the country by general and indiscriminate enlistment of employees engaged in this service is recognized by the government and the public.

"The company will discourage no man who feels it his duty to enlist, but it is believed that unless and until the need for their enlistment becomes greater than the importance of maintaining adequate street car service in the community, its employees, especially married men with dependents, will best serve the needs of the hour by continuing in their present employment and assisting in maintaining the best possible street car transportation. Under an order of the military authorities married men with dependents are not at this time subject to government service.

"No man will lose his seniority standing because of his enlistment, and so far as it is possible to do so, men who enlist will upon their discharge from government service be reinstated in the company's employ at the rate of pay and in the position as nearly equal to that held by them when they enlist as conditions at the time of their return will permit.

"Members of the co-operative beneficial association who enlist and continue the payment of their dues while in the government service will be entitled to the death benefit of $150 payable to their beneficiaries and to the prescribed sick benefits, providing they are not drawing their government pay during disability.

"Men who enlist will not thereby forfeit any right they may have at the time of their enlistment to benefits under and subject to the terms of the company's insurance and pension plan."

EMPLOYMENT OF WOMEN CONDUCTORS PRACTICABLE

The use of women conductors was generally considered to be practicable but not necessary for some time to come. One company reported it had fourteen applications on file from women who wanted such jobs. It was thought that the motormen would favor rather than object to the use of women conductors on their cars, and it was pointed out that extensive additional comfort facilities would have to be provided for them in the carhouses and employees' quarters.

In connection with the shortage of men in both the transportation and mechanical departments, it was believed the raising of wages was no longer an adequate means of holding the men, and that the government would soon have to take a hand in the labor problem and regulate it in some way.

INCREASED FARES ADVOCATED

The question of fare increases was the last one to be taken up. A rising vote showed that the majority of the members were interested in fare increases as a practical proposition on their own railways. Raising interurban fares to 2 cents per mile, reducing transfer privileges, charging for transfers and cutting out reduced-rate tickets were suggested as steps to be taken before asking for a 6-cent fare. It was generally believed that this was the most opportune time to obtain a fare increase, and as already reported it was decided to have a committee of five investigate this subject further in order that the railways could take united action on it.

According to John P. Dohoney, investigator of accidents for the Public Service Commission of Pennsylvania, 187 persons were killed in 1916 on the street railways of that State, as compared with 173 in 1915, and 3295 injured in 1916, as compared with 2495 in 1915. There was an increase of 32 per cent in the number of accidents on the street railways, the total number for 1916 being 2580 and in 1915, 2062.

N. E. L. A. Committees Summarize Technical Progress

The Reports Which Were Presented by Title at the New York Meeting of the National Electric Light Association Last Week Contain the Results of Investigations in Power Generation and Distribution—They Show Considerable Activity in 1916

AS was reported briefly in the issue of the ELECTRIC RAILWAY JOURNAL for May 12, the annual meeting of the National Electric Light Association was held in New York City on May 9 and 10. Among the reports presented by title but not discussed were several relating to power plant and line matters which are abstracted below.

A TREATISE ON PRIME MOVERS

The report of the committee on prime movers was contained in a 164-page pamphlet. It covered all phases of the subject and contained summaries and opinions from manufacturers and engineers on their respective specialties.

It appears that 1916 was a big year in steam turbine business. The Westinghouse Electric & Manufacturing Company sold one 70,000-kw. unit for 300 lb. per square inch pressure and 150 to 200 deg. superheat. This company is supplying other machines for equally high pressure and 200 to 250 deg. superheat. It sees no objections, from the standpoint of the turbine designer, to initial temperatures up to 650 or 700 deg. At present 76 per cent of the energy theoretically obtainable from steam expansion can be realized at the switchboard and further progress must come from the use of higher pressure. During the year the General Electric Company took orders for three times as much turbine business as was secured in any previous year. The average size of the machines was about 50 per cent greater than heretofore.

CONDENSER SIZES INCREASING ALSO

The Westinghouse Company also noted a demand for increased condensing surface in a single unit from 56,000 sq. ft., in one designed to serve a 35,000-kw. turbine, to 100,000 sq. ft. in one to operate in connection with a 60,000 to 70,000-kw., three-element turbine. The jet condenser record, made last year in an order for a 45,000-kw. turbine, has not since been broken, but there has been a considerable demand for jet condensers to serve turbines of about one-half this capacity. This company's aggregate business in surface condensers increased almost 450 per cent over the preceding year, the average large condensing equipment was 65 per cent bigger, and the average weight of condenser shells which the foundry and shop were called upon to handle increased by 55 per cent.

From this company's experience barometric condensers are gradually losing favor, not more than 5 per cent of jet condenser jobs recently having demanded this type. The low-level jet condenser almost invariably works out to be most economical except when water-level conditions are such that no circulating pump would be required for the barometric condenser, or in a few cases where the water available for cooling purposes is exceedingly bad. A most significant feature in the report of the Wheeler Condenser & Engineering Company was the increasing demand for the turbo air pump as compared with dry vacuum pumps. Dry vacuum pumps are preferred by many engineers but meet with objection very often on account of the space required. The turbo air pump is admirably suited for large capacity with small space occupied. In a number of instances a single large-capacity air pump has been used with a large condenser, and designs are now available for as high as 50,000-kw. capacity in one pump.

The Wheeler Company also noted a constant increase in the number of condensing plants using artificially recooled water, having built during the year 1916 what is probably the largest single tower in existence, one having a capacity of approximately 7500 gal. per minute. It also reported that many aspects of the problems connected with the corrosion of condenser tubes continue to baffle the ablest engineers and metallurgists, and the matter is subject to world-wide investigation.

GEARED AUXILIARIES BECOMING POPULAR

The Westinghouse Company reported increasing success in geared turbo exciters which are now built in units of capacity up to 1000 kw. Large machines like these supply not only excitation requirements but also direct-current loads in the vicinity of the power house. The prediction was made that the next few years will see the elimination of direct-connected turbine-driven pumps, blowers and generators, due to the prestige which the geared turbine enjoys. Even now orders entered for geared and direct-connected turbines are in the ratio of three to one in favor of gears.

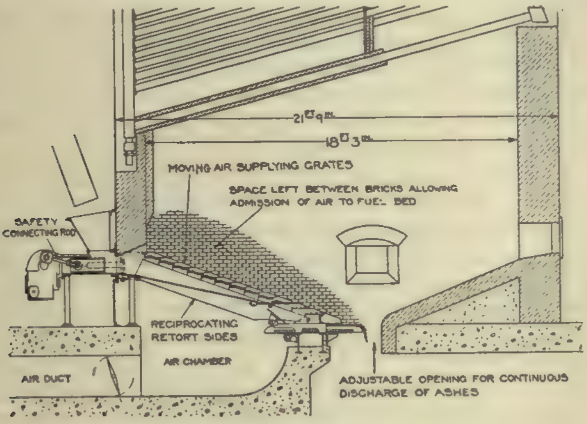
STOKERS AND FURNACES

The section of the report on stokers showed that this feature of the power plant is developing rapidly. The American Engineering Company, which makes the Taylor underfeed stokers, stated that the power-operated dump grate is largely employed on all types of its stokers, the latest type of stoker being one which employs these dumps and large retorts with triple pushers. In very large power houses stokers equipped with the automatic rotary ash discharge are being installed. Tests made with different types of this company's stokers on a 625-hp. B. & W. boiler showed all to give to a maximum furnace efficiency of about 80 per cent with from 350 to 450 lb. of coal burned per retort per hour. At heavier loads the triple-pusher stoker with the power-operated dump is the best. The large stokers operate at the same rate of fuel burning as the smaller with a much lower air pressure and consequently a smaller amount of power is required in the auxiliaries.

In comparing the rotary ash discharge with the power dump, it was noted that the former is designed to handle cold ashes, hence it is not always possible to provide the large amount of space necessary for cooling the brick wall and ashes. Where it can be used, however, it produces high efficiency which can be maintained for many consecutive hours when once a correct operating condition has been obtained. There is also less combustible in the ash. The power dump is preferable in power houses in which the boilers are banked for long periods, hence dead ashes and refuse must be cleaned out quickly.

The development work which had been done by the Westinghouse company during 1916 was mainly in adapting the underfeed stoker to high-ash Middle Western coals and lignite. To take care of the large amount of refuse with such coals the double-dump grate has been used with a complete success. Air can be admitted on both the front and rear dumps, and unconsumed carbon deposited thereon with the ash can be burned out before dumping. The rear dump alone can be used for dumping refuse, or both dumps can be used at the same time. This company reported a tendency especially in large plants to increase the size of individual boiler units, stating that boilers of 1000 hp. and more are rapidly becoming standard. These are characterized by simplicity of boiler setting, tending to eliminate brickwork troubles.

The Sanford-Riley Stoker Company called attention to the operating difficulties which have been experienced during 1916 on account of the scarcity of reliable labor. This company humorously remarked: "We have learned of a few new ways to neglect and abuse stokers, but the favorite abuse still remains in the ash pit." The best protection against such abuse is said to be a large easily cleaned ash pit. This company directed attention to an increase in combustion efficiency to be obtained by feeding fuel slowly through the retorts and by providing for large volumes of coal in the furnace. This may be accomplished by installing stokers back to back in a duplex setting, or by making the retorts extra large. In one plant installed by this company each 1140-hp. boiler was equipped with two 15-retort stokers set back to back, giving a total grate area of 417.8 sq. ft., and a ratio between grate area and water-heating surface of 1 to 27.3. There are about twenty tons of coal and coke in the furnace at all times.


21FT 9IN
18FT 3IN
MOVING AIR SUPPLYING GRATES
SPACE LEFT BETWEEN BRICKS ALLOWING ADMISSION OF AIR TO FUEL BED
SAFETY CONNECTING ROD
RECIPROCATING RETORT SIDES
AIR CHAMBER
AIR DUCT
ADJUSTABLE OPENING FOR CONTINUOUS DISCHARGE OF ASHES

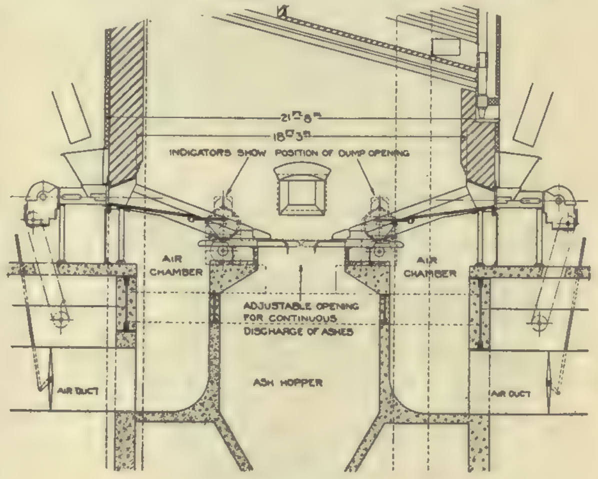
STOKER WITH EXTRA LARGE RETORTS

Another important development pointed out by the Riley company was in the use of ventilated side-wall construction, such as that developed at the South Boston plant of the Boston Elevated Railway. The admission of air along the side walls by one means or another preserves the brickwork and prevents the adherence of clinkers. The combustion seems to be induced on the surface exposed to the fuel, while the brickwork is cooled by the air, the combustion at this point resulting in ashes rather than clinkers. The temperature is kept high so that there is no adherence of clinkers to the brick, and no objectionable effect is noted in the fuel beds.

BETTER FURNACE LININGS ARE NEEDED

In summarizing the situation regarding refractory material the committee pointed out that the use of large boilers, with large combustion chambers and furnaces, has resulted in more frequent failures in the arches and side walls. This is due to the increase in firebrick surfaces and the expansion and contraction strains caused by the higher temperatures. Experiments in bracing the flat walls have not been very successful.

Further development is also needed in the refractory firebrick used for furnace lining. Variation of the composition of the clay, the method of manufacture and the heat treatment of the brick all have their effect on the final product, and it is necessary to select the brick with great care. A test is being made at present at the Fifty-ninth Street station of the Interborough Rapid Transit Company of New York City on a type of brick known as "Metalkase," designed to eliminate the adhesion and penetration of slag or clinker. A run completed last November was said to have shown satisfactory results. In general, it can be stated that the firebrick used should be high-temperature brick for arches and walls where overfeed stokers with chain grates are employed, with temperatures running up to 2800 deg. Fahr.; but with underfeed stokers the temperatures would not run much above 2400 deg., operating at a 200 per cent rating, if proper firing is used, and a high-heat resisting brick is not as essential as one of mechanical strength and resistance to abrasion by slag.


21FT 8IN
18FT 3IN
INDICATORS SHOW POSITION OF DUMP OPENING
AIR CHAMBER
AIR CHAMBER
ADJUSTABLE OPENING FOR CONTINUOUS DISCHARGE OF ASHES
ASH HOPPER
AIR DUCT
AIR DUCT

DUPLEX STOKER SETTING

The committee also reported a design of side walls for boiler settings in use at present by one company, built up with a 9-in. wall of firebrick, a 4½ to 9-in. wall of Armstrong cork "nonpareil" brick or "sil-o-cel" brick, and a 4½-in. wall of common red brick upon which is put an airtight coating of "armorcote" roofing cement. The mechanical bond between the walls is obtained by the usual header construction.

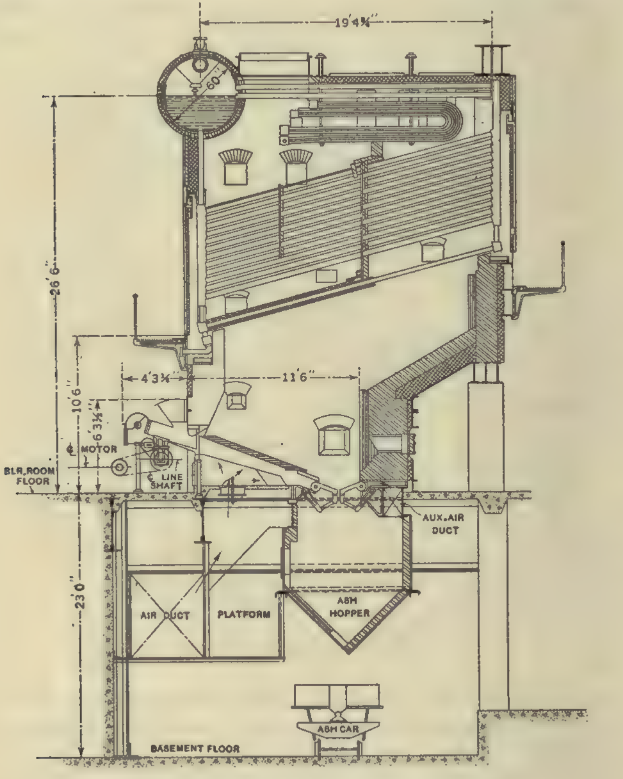
STORING AND HANDLING COAL

In view of the great interest in coal storage at present the committee devoted considerable space to coal-handling apparatus and to the weathering and oxidation of coal. A large number of diagrams and pictures of storage and handling arrangements were given in the report. From data available it appears that the loss in calorific value by weathering in the open is not serious generally, but under certain conditions may be so. For complete protection from spontaneous heating the only sure method is storage under water. The objections to this method are the moisture contained in the reclaimed coal and the liability of freezing in some localities.

It is very difficult to arrive at a definite conclusion regarding the qualities and characteristics of coal that can be stored without danger of spontaneous heating. A fair assumption is that coal which has such characteristics as to enable it to resist atmospheric influences resulting in air slacking is better suited for storage than coal of opposite characteristics. Moisture in small quantities without doubt accelerates the absorption of oxygen and increases chemical activity. Among other methods suggested for reducing the danger of oxidation are the avoidance of external sources of heat, elimination of coal dust and the maintenance of dryness.

ARE HIGHER PRESSURES DESIRABLE?

In view of the interest in the subject of higher boiler and turbine pressures, the committee made a considerable investigation of this subject, calling attention to the fact that recently a number of stations have been designed for pressures from 275 to 300 lb. per square inch with superheats of 200 to 250 deg. Fahr. The design of the boiler presents the principal problems in connection with higher pressures. The consensus of opinion seemed to be that while it is feasible to use pressures higher than 300 lb., the practicability of doing so is still open to question. As one company put it: "The only question of any real importance is, How much money will be saved by doing it?" In commenting on the matter Frederick Sargent, of Sargent & Lundy, Chicago, Ill., stated that the Commonwealth Edison Company has been planning to raise boiler pressures in the Northwest Station in Chicago but found that considerable changes in boiler design would be necessary. He pointed out that along with the raising of initial temperatures it is important to raise the average temperature in the turbine, which can be done by superheating the exhaust from the high-pressure end of the turbine before it enters the low-pressure end. If this is done and efficiencies are maintained all along the line, it will be possible to produce a kilowatt-hour at the switchboard for one pound of high-grade coal.



LATE TYPE OF SETTING FOR LARGE BOILER

Summing up the matter, the committee comes to the conclusion that a steam pressure of 300 lb., with 200 deg. superheat, or an equivalent total temperature, is about the practical limit until the manufacturers of prime movers and auxiliaries have developed new designs to meet the new temperature conditions.

OTHER MEANS FOR PRODUCING POWER PLANT ECONOMY

Along with the discussion of design characteristics of prime movers the committee investigated the methods of operation which would maintain or improve operating economy. One of the most important things is to keep the condensers clean. This cleaning may be divided into three stages: Clearing out the tubes without taking the prime movers out of service, cleaning during the night when the unit is out of service, and more general and thorough cleaning, which is done in certain cases only once or twice a year. Among the methods used for this cleaning are washing the tube sheets and tubes with a stream of water under high pressure, shooting leather disks through the tubes by means of compressed air, forcing bristle brushes through the tubes with the aid of water pressure, and baking by allowing steam to enter the condenser through the prime mover or from special lines connected to the bottom of the condenser. Where condensers need be cleaned only once or twice a year, sand blasting is used with success in removing scale.

Attention should also be given in power plants to the matter of keeping down pressure reductions in pipings and fittings. Where formerly steam velocities of 2000 to 3000 ft. per minute were commonly met with, values as high as 7500 ft. are now found, and certain authorities are advocating velocities above 10,000 ft. per minute. High velocities mean increased pressure drops, and, while there are certain advantages in their use, the fact remains that not enough consideration has been given to the subject of pressure drop in installing steam-generating equipment, piping and valves.

Pressure loss is an important factor for the reason that the capacity of most machines decreases materially when the pressure decreases as the loss of pressure does not take place wholly within the piping itself. Among the sources of pressure drop may be mentioned the dry pipe at the boiler, the superheater, the boiler valve, the boiler feed line, the separator and the steam strainer.

Another matter is the use of boiler-room instruments. Pressure and draft gages, thermometers, steam, air and water meters, coal-weighing devices and apparatus for gas analysis are all available. This year the committee made its first report on the subject of boiler-room instruments, comparing the several types available for each type of measurement. Among other novelties attention is directed to the air meter for use in the boiler room. This, in connection with the steam flow meter, gives an excellent indication of the carbon dioxide in the flue gases. Among water meters those of the V-notch type seem to be most popular, as they are easy to clean and calibrate and are particularly adapted to cases in which a gravity fall through the meter is permissible.

Summing up the report of the committee on prime movers, it would seem that most rapid development is being made at present in the furnace end of the steam boiler, while the hope for the future in increasing boiler output is in the use of higher temperature involving both higher pressure and greater superheat. From the operating side progress is being made in maintaining equipment with high efficiency as an aid to which the intelligent use of instruments is essential.

PROGRESS IN ELECTRICAL APPARATUS

While less extensive than the report on prime movers that of the committee on electrical apparatus, with the related reports on underground construction, overhead lines, etc., was also quite comprehensive. The standardization of electrical apparatus and methods of operation was considered of very great importance and during 1916 substantial work was done in the revision and extension of standards for transformers. In synchronous converters, sizes have increased steadily although slowly, the largest converter built to date having a continuous rating of 6825 kw., and the largest 60-cycle converter having a capacity of 5800 kw. Experience and improvement in the design of synchronous converters have made possible the elimination of the second starting tap, and it is now general practice to use on partial starting voltage a tap requiring one three-pole, double-throw switch (for 6-phase converters).

In order to prevent undue rise of potential in the shunt field winding of the converter, due to transformer action, it has been customary to use a field break-up switch, but one manufacturer is now using a three-pole, double-throw switch with discharge resistance mounted on the starting panel adjacent to the starting switch.

The committee on electrical apparatus also gave considerable attention to the outdoor substation and to the automatic substation both for low-tension commercial work and for use on railway circuits. Attention was called to the fact that these automatic substations have a particularly useful application in view of the present high price of copper. Progress is being made in the standardization of outdoor substations for commercial service, and outdoor current transformers and other suitable equipment have been developed. The committee stated that large users of transformers, oil circuit breakers, electrolytic arresters and feeder regulators are becoming more and more convinced of the necessity for periodically inspecting and testing insulating oil, and of dehydrating and purifying oil that has absorbed moisture. It was recommended that all companies adopt systems of oil inspection, and to this end the committee gave full instructions for testing oils.

Progress in Thrust Bearing Lubrication

Attention was also directed to the problem of furnishing adequate lubrication for bearings of hydroelectric generators. A new plan for this purpose consists of the use of an oil pump mounted in a casing supported from the lower guide bearing of the machine. The pump so placed in the reservoir or casing pumps oil through a filter mounted immediately alongside of the machine. After being filtered the oil returns by gravity through a separate chamber to the reservoir, where another pump, geared directly to the main shaft, forces it into the chamber that supports the thrust bearing. It flows then by gravity to an upper and lower guide bearing back to the lower reservoir. Along this same general line it is of interest to note that many spring-thrust bearings are now in successful operation, the largest carrying 225,000 lb. at a speed of 514 r.p.m. The stationary ring in this bearing is supported on a cushion of coiled springs. This ring, like the rotating ring, is grooved radially to permit circulation of oil.

The committee on underground construction and electrolysis reported on current capacity of cables; cable specifications for various classes of service; use of split-conductor cable; new design of three-conductor cable, and special devices and methods. It appears that much progress is being made on the first-named topic, and the conditions which determine the safe current capacity are being formulated. Split-conductor cables are coming into use, their purpose being to permit the use of protective devices to cut cables out of service automatically in case of trouble, without recourse to separate pilot wires. A plan involving the use of pilot wires consists in tripping the circuit breakers on the ends of the line through the medium of a balanced relay connected to the two ends. When the current entering and leaving the cable is the same the relay does not act, but if there is a short-circuit between the ends the relay field is unbalanced and the relay trips the breakers.

Overhead Line Matters

The committee on overhead lines and inductive interference reported that it had not undertaken to give attention to the details of overhead line construction to any considerable extent but had accumulated certain test data on the strength of standard 1½-in. locust pins, and was keeping in touch with the experience of companies using medium hard-drawn wire. It also recommended that the companies co-operate in gathering data relative to the effect of the application to actual construction of the line sections of the National Safety Code. The committee discussion of inductive interference related entirely to non-railway circuits but is of interest to railways which are doing a power business in suburban communities. The interference cases are mostly due to the necessary use of highways for power transmission lines. In this connection an appendix to this report, by John B. Taylor, is valuable in stating in an elementary way the causes and principles of prevention of inductive interference.

On the subject of power transmission and distribution, a paper by J. O. Hardin of the Georgia Railway and Power Company, on "Methods for Working on Live High-Voltage Lines," was to have been read at the convention. This contains an account of the practices of the company in eliminating interruptions to service due to cutting off power for repairs on the line. By the use of simple special tools and easily understood rules it is possible to make repairs on almost any kind of high-voltage lines without interrupting service. Mr. Hardin tells exactly how this can be done and his paper is elaborately illustrated.

Electric Tramways in Australia

The following table is taken from official statistics relating to electric tramways in the commonwealth of Australia, published in a recent issue of *The Electrician*. Compared with 1915, there was an increase of 39.5 route-miles of line opened and in the number of cars employed. Of the 386.56 miles operated, 311 are standard gage, 71 are 3-ft. 6-in. gage, and the remainder 5-ft. 3-in. gage.

The various tramway services, including electric, steam, cable and horse, are controlled as follows: Government, 296¼ miles; municipal, 123½ miles; private, 142¾ miles.

STATISTICS ON ELECTRIC RAILWAYS IN AUSTRALIA

State	Mileage (Route) Open	Capital Cost	Energy Generated (Kw.-Hr.)	Tram-Miles Run	Gross Revenue	Working Expenses	Passengers Carried	Number of Cars
New South Wales...........	150.04	£7,349,866	81,689,000	25,407,000	£1,834,023	£1,469,226	269,634,000	1,430
Victoria	70.57	1,061,067	7,500,000	4,436,000	204,671	151,543	30,676,000	193
Queensland	38.20	1,437,550	10,002,000	4,112,000	347,437	193,367	48,162,000	154
South Australia	57.00	1,517,148	11,584,000	4,914,000	309,915	191,070	42,287,000	170
Western Australia	50.75	1,092,285	4,984,000	2,782,000	181,340	129,422	17,501,000	121
Tasmania	20.00	336,214	1,368,000	925,000	62,317	43,514	7,183,000	52
Total for Commonwealth..	386.56	£12,794,130	117,127,000	42,576,000	£2,939,703	£2,178,142	415,443,000	2,120

Higher Revenues Asked in New York

Special Electric Railway Committee Informally Shows to First and Second District Commissions the Need of Financial Relief—Six-Cent Fare Suggested Up-State, and Two-Cent Transfer Charge in New York City—Formal Hearings to Be Held Soon

THE last week has seen marked progress in the movement to secure increased revenues for electric railways in the State of New York. Informal conferences have been held between a special committee of the New York Electric Railway Association and the Public Service Commissions for the First and Second Districts, to show to the regulatory bodies the urgent need of the companies for higher fares.

As a result of these conferences it is probable that formal applications for relief will be made to the two commissions in the very near future, and public hearings will then be held. The general sort of relief desired in the First District, or New York City, appears to be a 2-cent charge for transfers, while the up-State lines in the main prefer an advance in the unit rate of fare.

SPECIAL COMMITTEE APPOINTED

The first step in the general movement was made on May 11, when the New York Electric Railway Association, at a special meeting in New York City, authorized the appointment of a committee of ten to consider ways and means for obtaining additional revenues. This committee was instructed to take the matter up with the commissions and to secure, if possible, the general consent of the companies to some plan of action.

In view of the possibility that the railways in the Metropolitan district might desire a form of fare increase different from that favored in the remainder of the State, it was decided that the committee of ten, while acting as a whole on matters of policy, should be divided into groups of five members for each regulatory district. Each group could then take up the specific needs of the railways in its territory.

As a result of this action by the association, President J. P. Barnes appointed as members from the First District the following: T. P. Shonts, president New York Railways; T. S. Williams, president Brooklyn Rapid Transit Company; E. A. Maher, Sr., president Third Avenue Railway; W. O. Wood, president New York & Queens County Traction Co., and A. E. Kalbach, receiver Second Avenue Railroad. For the Second District President Barnes appointed the following: L. S. Storrs, vice-president Westchester Street Railroad; H. E. Andrews, president New York State Railways; H. B. Weatherwax, vice-president United Traction Company; C. Loomis Allen, receiver Empire United Railways, Inc., and Joseph K. Choate, vice-president J. G. White Management Corporation. Mr. Choate was made chairman of the committee.

PRESIDENT SHONTS ISSUES STATEMENT

While this special committee was laying its plans and arranging to present its case informally to the Public Service Commissions, the New York Railways took several steps to inform the public about the general situation confronting the company. On May 14 President Shonts issued an explanatory statement in part as follows:

"This company has for sometime past been confronted with a very grave increase in the cost of operation. That tendency has recently become alarming. During the last year we have increased the wages of our men to enable them to take care of the high cost of living. We are paying very much higher prices for the materials we use. The number of people traveling on the surface lines of the city of New York has not increased substantially in the last ten years. Any increase of electric railway travel in this city of recent years has been almost entirely on the elevated and subway lines. That increase, of course, does not benefit the surface lines. The subway and elevated lines are prospering, but the surface lines are threatened with bankruptcy unless present tendencies are arrested.

"It is absolutely necessary that the New York Railways improve their revenues. Though the stock of the New York Railways is owned by the Interborough Consolidated Company, that stock pays no dividends and it is not conceivable that under any conditions which can now be foreseen in the near future, any payment on such stock would be possible. We are not now concerned with attempting to earn dividends on that stock. Our concern is to save the green car lines from receivership, for toward receivership these lines are moving with a steadily accelerating pace.

"A good many years ago all the surface lines in New York were consolidated into one system. That system went into bankruptcy, and the result was a disintegration of the formerly unified system. That disintegration separated the Third Avenue and the Second Avenue lines from the old system, disturbing the transfer arrangements which had previously existed. If the New York Railways is forced into a receivership, a further disintegration of the system is likely, with disturbance of the present arrangements between the different units of the system. In case of such disintegration, the separate companies, then restored to their managements, would, of course, have the right to charge independent fares for each passenger. The people of New York City pay a nominal 5-cent fare for a ride on their street railways. The subway and elevated lines obtain a full 5-cent fare for each passenger. Owing to the transfer arrangements the result to the New York Railways is only about 3½ cents for each trip.

"We expect shortly to bring the matter formally to the attention of the Public Service Commission to obtain, we hope, its advice and assistance in increasing our revenues. Before doing so, however, we wish the whole subject to be brought to public attention, in order that the public may be both informed and consulted as to what steps shall be taken before these steps are definitely attempted.

"We shall expect to lay all the facts before the people of New York, for we realize that the good-will of the public is a supremely important factor in this, as in other matters. Our purpose is to protect our service to the people of this city, and to that end we earnestly seek the co-operation of every citizen. We feel confident that the public sense of what is fair and right will, upon consideration of the facts, realize that our needs are real and that to satisfy them will be in the public interest."

ASKING THE CO-OPERATION OF BUSINESS MEN

In line with his policy of informing the public, President Shonts on the same day sent letters to the presidents of the Chamber of Commerce, the Merchants' Association and other leading commercial and taxpayers' organizations, offering to show them the company's books and inviting them to examine the facts. After explaining the serious situation in which the company finds itself, President Shonts said:

"I am writing to you and to various other representative organizations of business men and taxpayers to request that you refer this matter to an appropriate committee of your organization with a suggestion that we should be glad to place before such committee full data in support of what we believe to be the merits of our position. We shall place ourselves at the service of such committee to enable it to arrive at a conclusion entirely satisfactory to itself.

"We earnestly hope to solve this problem in a way which will commend itself to the public opinion of New York. We shall shortly bring the matter formally before the Public Service Commission. In the meantime we are earnestly hoping that the people of New York, through such representative bodies as those mentioned, will inquire into the situation for themselves."

ANNOUNCING ITS 2-CENT TRANSFER PLAN

On May 15 President Shonts placed the need of a 2-cent transfer charge before the public in a statement in part as follows:

"It is not the purpose of the New York Railways to ask the Public Service Commission for permission to charge a 6-cent fare. We hope to be able to adhere to the present basic rate. We shall ask permission to charge 2 cents for transfers; in other words, to carry people as far as they want to go on a continuous ride for 5 cents, but to ask those who take additional rides to pay something for them.

"The cost of labor and materials is increasing at a greater rate than the present earning power of the New York Railways can stand. Taxation has each year taken more than $1,500,000 on the average for the last five years, or more than 11 per cent of our gross revenue from railway operations. Greater tax burdens must be met in the immediate future. After paying interest on its bonds, and with no payment on its stock, the New York Railways in 1916 had $2.70 left from its earnings for the year. The company paid out for wages $5,297,000 in the year ended June 30, 1916; it will pay during the current fiscal year, $6,336,000, an increase of $1,839,000. Part of this increase is due to extra allowances to the men to maintain the service during the strike, but the present scale of wages, even upon a comparative basis, is more than $600,000 in excess of that for 1916.

"There were 257,028,563 passengers who paid a 5-cent fare on our lines last year. About 92,000,000 of these used transfers, leaving about 165,000,000 who paid 5-cent fares and took no transfers. Before increasing the fare charged to those who took no transfers, it would seem only fair to ask those who used two or three to pay for the privilege. We estimate that a charge of 2 cents for transfers will add about $900,000 to our gross income. This sum added to our earnings will not enable us to pay dividends on stocks; it will simply protect the company from bankruptcy."

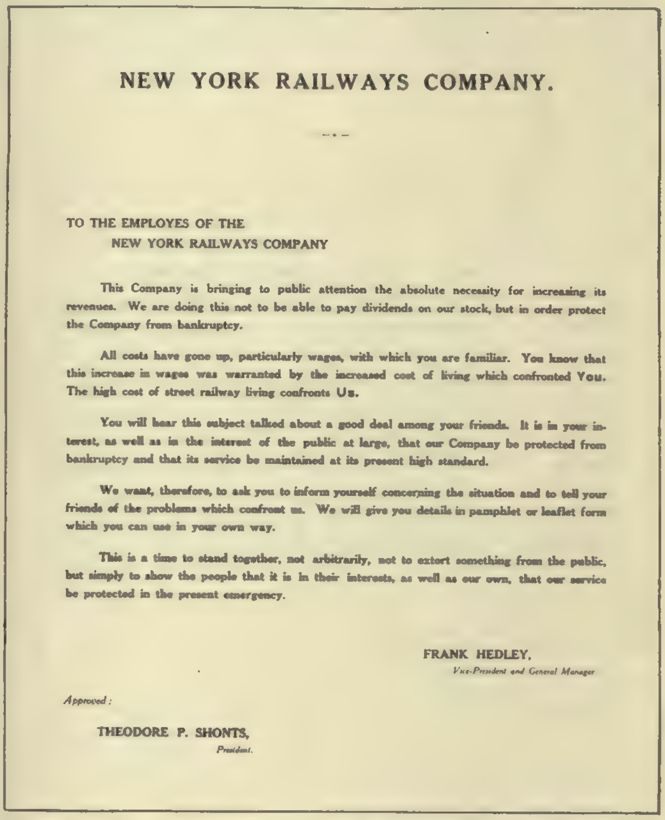
The New York Railways also placed on all its employee bulletin boards a placard, as shown in the accompanying illustration, calling attention to the revenue-increase movement and asking employees to inform themselves concerning the situation and tell their friends.

VALUATION NOT NEEDED

In regard to the necessity of a valuation of the New York Railways property, President Shonts issued a statement to the effect that a valuation was made while the property was in the hands of receivers. Both the reorganization committee and the engineers of the Public Service Commission made careful appraisals, he said, and the lowest figure found by the commission was, as of Oct. 1, 1910, $85,801,000. On account of capital expenditures the minimum valuation is now $89,066,000 for property actually in public service.

The aggregate amount of stocks and bonds in the hands of the public (including underlying bonds of merged companies and including the stocks and bonds of leased companies) in 1916 was $99,454,978. The entire return actually received by the holders of these securities was $3,455,610, or 3.5 per cent upon the total amount of securities issued. This money paid to the holders of securities represented 3.9 per cent upon the minimum valuation.

A charge of 2 cents for a transfer, bringing in about $900,000, would permit a return representing only 4 per cent upon the total capitalization and 4.9 per cent upon the minimum valuation. The stockholders, President Shonts said, have never received a dividend, and the holders of the adjustment income 5 per cent bonds have never received the full interest. For the last ten months of the current year, exclusive of strike expenses, the company has not even earned the interest on its 4 per cent bonds.



NEW YORK RAILWAYS COMPANY.

TO THE EMPLOYES OF THE
NEW YORK RAILWAYS COMPANY

This Company is bringing to public attention the absolute necessity for increasing its revenues. We are doing this not to be able to pay dividends on our stock, but in order protect the Company from bankruptcy.

All costs have gone up, particularly wages, with which you are familiar. You know that this increase in wages was warranted by the increased cost of living which confronted You. The high cost of street railway living confronts Us.

You will hear this subject talked about a good deal among your friends. It is in your interest, as well as in the interest of the public at large, that our Company be protected from bankruptcy and that its service be maintained at its present high standard.

We want, therefore, to ask you to inform yourself concerning the situation and to tell your friends of the problems which confront us. We will give you details in pamphlet or leaflet form which you can use in your own way.

This is a time to stand together, not arbitrarily, not to extort something from the public, but simply to show the people that it is in their interests, as well as our own, that our service be protected in the present emergency.

FRANK HEDLEY,
Vice-President and General Manager

Approved:

THEODORE P. SHONTS,
President.

PLACARD ASKING CO-OPERATION OF EMPLOYEES IN MOVEMENT FOR INCREASE IN FARES

CONFERENCE WITH FIRST-DISTRICT COMMISSION

On May 16 Messrs. Shonts, Williams, Kalbach, Wood and Maher, Sr., representing the special committee of the State association, held an informal public conference with the members of the Public Service Commission for the First District. At the close of the conference Mr. Maher announced that the ommittee would be ready to proceed with formal hearings by the next week. No date was set by the commission. However, Chairman Straus announced that a date would be set after a formal application had been made, in connection with which there would be a conference between railroad and commission counsel, with reference to the form or forms that the application should take. It was practically decided, the commission stated, that each company or system should make a separate application for relief.

The first speaker at the conference was Mr. Maher, who stated that he hoped the commission would do something quickly to help the companies out of a situation that was momentarily growing worse. The commission, he believed, could grant relief.

Mr. Shonts stated that in the last thirteen years the surface-line traffic in Manhattan had decreased one-tenth of 1 per cent. There had been some increases, but these had been more than absorbed by decreases incident to the opening of the rapid transit lines. The surface-line traffic, therefore, is practically stationary. The only seeming relief available is a 2-cent charge for transfers—something that would not affect the great bulk of the traffic, would leave the company probably $2,000,000 short of an 8 per cent return, but might be sufficient to tide it over until a decrease should come in the cost of materials, labor and other essentials of electric railway operation.

Mr. Williams, who followed Mr. Shonts, stated that the situation was somewhat different in respect of his company. He referred to the commission's order of three years ago which vastly increased the number of transfer points and the number of transfers issued on the Brooklyn lines. "That order has been obeyed," said President Williams, "but its effects have been increasingly bad from the standpoint of providing less revenue for us. It seems to us that our natural, easiest way of relief is by having that order changed. We have no thought of depriving a passenger of a continuous ride upon one line or possibly two lines, but the system of granting transfers to many lines has grown into an abuse. Hence it is likely that we shall make a formal application for a modification of the commission's transfer order so that while the passenger will still have a 5-cent fare from the residence sections of Brooklyn to the business section of Brooklyn and Manhattan, we shall be allowed to make a charge of 2 cents for transfers except as to transfers to and from what are commonly termed 'feeder' or 'continuing-trip' lines. It is not a question of receivership with us. It is a question of progressing. We believe that we are a progressive company, but we must have sufficient earnings to justify the construction of new lines as they are needed if we are to serve Brooklyn properly. The company must have a sufficient margin of credit."

Mr. Kalbach stated that what his company needs is additional transfer privileges at 2 cents, that line having practically no transfers except to a separate cross-town line. Mr. Wood said that he would only ask that something be done sufficient to permit his company to meet its operating expenses and fixed charges.

QUESTION OF POWER

Considerable discussion was carried on during the conference in regard to the provision of law upon which the committee expects to base its request for an increase in rates. J. L. Quackenbush, general attorney New York Railways, contended that under the present law the commission has plenary power to fix rates. According to Mr. Quackenbush, the Ulster & Delaware and North Shore Traction Company decisions clearly point out that the commission has, until the Legislature decides otherwise, the unrestricted power of the Legislature in rate regulation. Moreover, the commission can fix the terms and conditions of transfers, extend their use or abolish them altogether. Mr. Quackenbush said that the city companies wanted to charge for only the first transfer. Other transfers would be negligible as far as any advantage the companies might gain by making passengers pay for them.

HEARING BEFORE SECOND DISTRICT COMMISSION

Simultaneously with the conference in New York City a meeting was being held in Albany between the other half of the special committee and the commissioners for the Second District. The electric railway men in attendance were Messrs. Choate, Storrs, Andrews, Weatherwax and Allen, as well as T. C. Cherry, general manager Empire United Railways, Inc.; C. K. Addison, Long Island Railroad, and President Barnes.

Mr. Choate was the spokesman for the railway men. Many of the companies in the State, Mr. Choate urged, face a condition already bordering upon bankruptcy. He presented figures to show that the cost of materials for street railways has mounted from 40 to more than 100 per cent during the last three years; that wages have gone up, and that only the city fares of the companies have remained stationary. He said that severe pressure was being brought upon the companies to grant further wage increases on account of the great increase in ordinary living expenses. As a means of obtaining partial relief, Mr. Choate asked that the street railways be permitted to petition the commission for a uniform advance of fares from 5 to 6 cents.

"The manufacturer," said Mr. Choate, "can raise his price to keep pace with his costs. It is what every private enterprise has been doing. Every item that enters into the cost of living is increasing. Street railway costs are mounting on a faster ratio than any other, yet our prices have been kept at the same level."

Mr. Choate called attention to the facts shown in the commission's latest annual report, indicating that while gross earnings of street railways outside of New York City have increased within the last ten years, particularly during the increased industrial activity during the last year and a half, net earnings have shown a steady decline.

After the conference the commission stated that the street railways of every city in the State outside of New York City would probably file applications for additional revenue through increased fares, charges for transfers or other means. In view of the urgent nature of the case presented by the railways, the commission will commence hearings on these applications as a group at an early date. After the presentation of the case of the railways as a whole, the different conditions affecting each company will be taken up and passed upon by the commission.

War Revenue Tax Hearing

Electric Railways Ask Senate Committee to Tax Long-Haul Automobile as Well as Rail and Water Transportation

AT a hearing before the Senate finance committee on May 12 the electric railway industry presented its comments upon the war revenue tax bill, which is designed to produce $1,800,000,000. The main suggestion made was that the same tax be placed on automobile lines engaged in long-haul passenger and freight transportation as is imposed upon electric interurban railways.

Section 500 of the bill, as far as electric railways are concerned, provides for the following: A tax of 3 per cent of the amount paid for transportation of freight by rail or water; a tax of 10 per cent for transportation of property by express; a tax of 10 per cent of the amount paid for transportation of persons by rail or water, not including the amount paid for commutation or season tickets for trips less than 30 miles or fares less than 25 cents. These taxes are stated in broad terms. The following sections deal with modifications, exceptions and technicalities which will undoubtedly be revised by the Senate committee before the bill is reported.

In seeking a hearing on the foregoing provisions, the electric railway industry did not endeavor to use any more time than was granted to other industries. Indeed, not so much time was used as in some instances. The attitude of the industry was explained to the Senate committee at a brief hearing by Arthur W. Brady, president Union Traction Company of Indiana, Anderson, Ind. Mr. Brady represented the American Electric Railway Association and also, with others present, the New York Electric Railway Association, the Pennsylvania Street Railway Association, the Central Electric Railway Association and the California Electric Railway Association.

Mr. Brady explained that he was speaking especially in behalf of the interurban lines, because the 25-cent limitation for the tax basis would cut out the ordinary street railway fare. The interurban lines, he said, had since the advent of the automobile been confronted with active competition in certain parts of the country on an extensive scale. Regular automobile lines had been established, for instance, between San Francisco and Los Angeles, Cal., a distance of practically 500 miles, and between San Diego and Los Angeles. For several years property and persons have been carried by automobile between those points over the regularly established lines, and the same way between Los Angeles and Bakersfield. In Minnesota, lines are in active operation for a distance of 30 or 40 miles out of St. Paul and Minneapolis. In Indiana and the Central West there are lines of from 10 to 35 miles already in existence, and with the improvement of roads in the progress of the good-roads movement and the building of the hard-surface, bricked or concreted roads, that phase of competition is developing very rapidly. Continuing, Mr. Brady said:

"The result of imposing the 10 per cent tax upon the electric interurban business and leaving the automobile business exempt would be simply to place the interurban railroads at a very great disadvantage in the conduct of that business. There is no one of the utility businesses of the present day that is conducted upon a closer margin than the electric railway business, whether it be the street railway business or the interurban business. Therefore, as a matter of mere fairness, it is the belief of the electric railways that this same tax which is imposed upon the electric railways should be imposed also upon motor transportation between specified points. It is not meant that it should cover the taxicabs and other vehicles which make special or occasional trips."

To meet the situation Mr. Brady proposed an amendment to the effect that the tax should cover transportation "by automobiles operated as common carriers of persons or property between specified points." The 25-cent fare clause in the bill would eliminate all but the long hauls.

Mr. Brady was questioned, during his statement, by the various Senators. In replying to a query regarding the comparative costs of automobile and electric railway operation, he said:

"It was thought a few years ago by the electric railway people that the automobile could not stay in the game. But it has proved that it can. You cannot run a Packard automobile in competition with the ordinary electric railway. But you can run a Ford, and a number of the other lighter and cheaper cars. With good roads and highways supplied by the public, with no expense except that of gasoline and tires and ordinary maintenance, we fear very much that these cars can compete with our lines to an appreciable extent in carrying freight. We know that they actually are trying to do it."

Another amendment proposed by Mr. Brady covered the handling of fractions of a cent in imposing the tax upon the passenger or shipper. In order to make it clear that a full cent might be added to the fare or freight in such a case, the following amendment was proposed: "Whenever the addition thus made to any fare or other charge shall include a fractional part of a cent, 1 cent may be added by the carrier for and including such fraction." The especial importance of this amendment to electric railways, Mr. Brady stated, is found in the fact that their fares are in a very large number of cases, approximating probably one-half, paid upon the cars in cash to the conductors. This is true even in the case of the longer interurban rides. It is highly important, therefore, that opportunity for controversy be eliminated and the convenience of calculation be facilitated as far as possible. The slight addition to the charge thus provided for would not begin to compensate the carrier for the expense of accounting which the imposition of the tax would cause.

War-Time Economies

Plan for Trainmen to Help Farmers—Women Now Being Considered for Front-Platform Duty

DURING the past week reports from electric railways that are considering the use of women employees continue in evidence. The movement to increase agricultural production has also progressed, and at the present time a large percentage of the railway companies have under cultivation most of the unused land that they hold. A new phase of the movement appears in the recent action of the Beaver Valley Traction Company, New Brighton, Pa., where plans are being laid to have employees co-operate with farmers during harvest time.

The proposed arrangement is outlined in the following abstract of a bulletin to train men published by W. H. Boyce, superintendent Beaver Valley Traction Company: "How many of you would be willing to aid the State and nation by co-operating with such of the larger farmers as might need your services at planting or harvesting time? For possibly two or three days a week, half of our force could go to the country, and of course on these two or three days the other half of the force would have to work double time. This won't be nearly so much of a hardship as some of our boys are going to go through in France. No doubt the farmer would be willing to pay for your services, and the man who stays on the job and works an eighteen-hour turn, together with the man for whom he is working and who has gone to the farm, can pool and divide equally the wages for that day. I am afraid that the gravity of the situation has not been fully appreciated. If we do our duty as American citizens we are going to have work, and plenty of it, cut out for us before another year rolls around. Will you co-operate?"

On the New York, Westchester & Boston Railway, an unusually elaborate plan for truck gardening has been introduced owing to the large amount of unused land held by the company. Early in April all of the employees were notified that the use of such property would be available for gardening purposes, and about 25 per cent of them took advantage of the offer. The plots averaged from one-sixth of an acre to a full acre, each man being given as much property as he desired after he assured the company he would be able to cultivate it. At the present time all of the plots have been plowed and harrowed, and some planting has been done. Each employee has been furnished with pamphlets of instructions regarding this work, issued by the New York City Commission and by the United States Government, as well as copies of the book of instructions of the Bureau of Agriculture, on the raising of vegetables on a small scale. Last week arrangements were made with a well-informed gardener and farmer to deliver a lecture to the men so that they could learn how to plant properly and how to store the vegetables which they raise, so that these may be kept during the ensuing winter. With each plot there has been issued a permit providing space for a sketch map of the plot in question, as well as the rules governing the use of the land. The latter require the property to be used for garden purposes only, and the lessee must use reasonable diligence in its cultivation and remove all incumbrances at the conclusion of the lease. The permit, including a report of the crop that is harvested, is to be returned to the company at the expiration of the lease.

WAR-TIME ECONOMIES—UNUSED LAND OF THE NEW YORK, WESTCHESTER & BOSTON RAILWAY UNDER CULTIVATION

EMPLOYMENT OF WOMEN

The employment of women as conductors is still being considered as a possibility by a number of electric railway companies. One feature of this movement is the report that thirty young women of Flushing, N. Y., members of the National Association for Women Service, have volunteered their services as conductors to W. O. Wood, president New York & Queens County Railway. The ostensible reason put forward for this flattering offer is that there is expected to be a shortage of men because of the war.

From England comes a report that the general use of women as motormen is being given serious consideration. This is put forward as the only alternative to a severe curtailment of the tramway service, or even in some cases its entire suspension, owing to the increasing demands for more men by the military authorities. Statements are made that where women have been tried as motormen they have been generally successful. At Glasgow, where they have been used for more than six months, their duties have been performed satisfactorily, and in general they have displayed resourcefulness in the emergencies which have arisen from time to time in connection with the operation of cars. The service in Glasgow is relatively fast, and the vehicular traffic very heavy, so that there is believed to be no insuperable difficulty in finding women able to cope with the conditions elsewhere in the United Kingdom, with the possible exception of a few streets in the metropolitan districts of London.

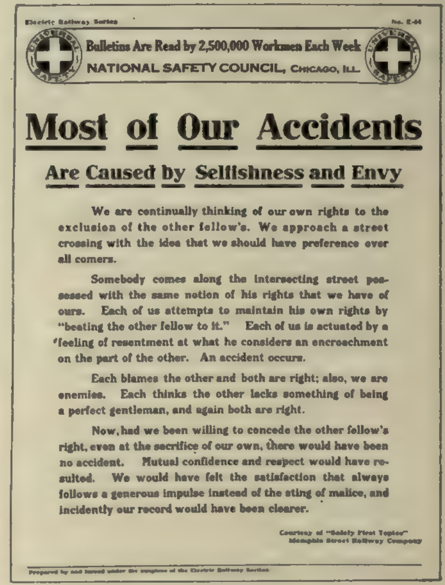
On the East St. Louis & Suburban Railway the possibility of using women conductors in the event of war emergencies was recently placed before the platform men, who eventually waived all objections on patriotic grounds. On the lines of the Puget Sound Traction, Light & Power Company the possibility of using women operators on one-man cars is being seriously considered as an eventual possibility. In an order of the local Public Service Commission permitting the traction company to put on a number of these light cars in Seattle, the equipment is specifically described as being of a type handled by one "operator," the use of the term "man" being intentionally avoided. These cars, it is said, will be used on short runs, and under these circumstances women are expected readily to qualify for their operation.

Employees of all of the public service corporations of Greater New York are being mobilized through the co-operative action of the various companies and the Public Service Commission, and a number of committees have been appointed to centralize control of the resources and facilities of all of the organizations so that they may work together as a unit during the present emergency. On May 17 a meeting was held to consider means for avoidance of the crippling of service through enlistments of employees who are vitally needed in their present positions, and it was decided that the executive committee of the co-operative organization should act on this matter. One of the plans suggested was for the committee to take up with the exemption boards, which will be appointed subsequent to registration for universal military service, the need for exempting certain specially trained public utility employees, whose services were vitally necessary to the public welfare.

Co-operation Between Railways and N. S. C.

The accompanying reproduction of a recent National Safety Council electric railway poster shows how individual railways can co-operate with the council in the national movement. This can be done by preparing suitable material for local use which can later be brought to the attention of the industry through the council bulletin service. In the present case the source of information is *Safety First Topics*, which is published monthly by the Memphis (Tenn.) Street Railway.

An account of the first issue of this publication appeared in the ELECTRIC RAILWAY JOURNAL, Aug. 12, 1916, page 294. Its purposes are to keep the employees thoroughly informed of all activities of the company in the safety-first movement and to publish comment and discussion from them.



Electric Railway Series No. E-44

Bulletins Are Read by 2,500,000 Workmen Each Week
NATIONAL SAFETY COUNCIL, CHICAGO, ILL.

Most of Our Accidents

Are Caused by Selfishness and Envy

We are continually thinking of our own rights to the exclusion of the other fellow's. We approach a street crossing with the idea that we should have preference over all comers.

Somebody comes along the intersecting street possessed with the same notion of his rights that we have of ours. Each of us attempts to maintain his own rights by "beating the other fellow to it." Each of us is actuated by a feeling of resentment at what he considers an encroachment on the part of the other. An accident occurs.

Each blames the other and both are right; also, we are enemies. Each thinks the other lacks something of being a perfect gentleman, and again both are right.

Now, had we been willing to concede the other fellow's right, even at the sacrifice of our own, there would have been no accident. Mutual confidence and respect would have resulted. We would have felt the satisfaction that always follows a generous impulse instead of the sting of malice, and incidently our record would have been clearer.

Courtesy of "Safety First Topics"
Memphis Street Railway Company

Prepared by and issued under the auspices of the Electric Railway Section

RECENT N. S. C. POSTER ON ACCIDENT-PREVENTING COURTESY

COMMUNICATIONS

Practical Trials Suggested for Equalizer-Bar Trucks

THE J. G. BRILL COMPANY
PHILADELPHIA, PA., May 16, 1917.

To the Editors:

It would be probably a beneficial happening if the interest in truck design, manifested in the communications in your May 5 issue by F. M. Brinkerhoff and W. F. Keisel, Jr., would become more general. Doubtless both the operating railroad man and the truck-designing engineers would welcome a condition which would make your columns the medium for a free and open discussion of this much-discussed yet never-settled question of truck equalization.

Mr. Brinkerhoff's article bears the caption "Equalizer Bars Not Necessary," and with this statement I register in the affirmative, because equalizer bars are not necessary, though desirable. S. A. Bullock, however, prefaces his original article on the subject in your April 21 issue—I think very properly—with the remark, "It is desirable that all trucks be equalized," and one must confess that the two statements are widely different.

When Mr. Bullock's arguments are analyzed, it will be seen that his suggestion is to distribute equally the center-pin load on all points of track bearing; *i.e.*, the wheels. Mr. Brinkerhoff agrees with him in the general idea (and I think almost everyone will) but differs in the method of accomplishment. Mr. Bullock favors the equalizer bar, with which we are all familiar and which is adequately described by him, whereas Mr. Brinkerhoff leans toward a flexible side frame for the truck, contending that it gives the same result.

In an equalizer-bar type of truck, the movement of the said equalizer bar is restrained by springs which distribute the load, and if the stability of the truck would permit, these springs (theoretically to produce the best result) should be located at the longitudinal center of the truck, leaving the ends of the equalizer bar free to raise and lower as the track conditions demanded. The need for stability in the truck prevents this central point of bearing. By the very design, however, the nearer the center the more thorough the equalization, with relatively the same degree or uniformity of vertical stress. With the flexible frame design, in my judgment, there is no attempt whatever at equalization, and the stresses consequently vary according to the degree of flexibility, no mechanical means being introduced to equalize or distribute the weight on each of the several track-bearing points or wheels.

In passenger service I personally do not know of any cases where the arch-bar truck has proved satisfactory in comparison with an equalizer-bar truck. I think I can safely say that there have been a great many cases wherein arch-bar trucks were installed under electric motor car bodies and where their failure was most palpable. Furthermore, it is only fair to say that this was with not one make of arch-bar truck alone. Practically all the truck builders who have tried it have met with exactly the same result.

Mr. Bullock and Mr. Kiesel have disagreed with regard to the requisite spring base to produce equalization, but I rather gather they are both talking about a different item, Mr. Bullock referring to the spring base of the equalizing bars of the truck in equalized trucks, which is generally the spring base, and Mr. Kiesel referring to the spring base of the truck. In my opinion the spring base of the equalizing bar should unquestionably be less than the wheelbase of the truck. Perfect equalization would require a centrally-located spring or point for carrying the load, and as a consequence the nearest approach to this longitudinal center that will be permitted by the required stability gives the most efficient system of equalization. I contend that perfect equalization would be obtained from practically a knife edge supporting the weight on the center of the equalizing bar at the longitudinal center of the truck.

After all, a trial may be conclusive, and I recommend the following, realizing fully that while the comparison is between six-wheeled trucks and four-wheeled trucks, it is also between equalized versus non-equalized trucks: Ride on one of the most excellently appointed trains on the Pennsylvania Railroad between Philadelphia and New York, try the Pullman equalized truck and then try a Pennsylvania coach which, I claim, is mounted on a non-equalized truck. To go further, try the two types of truck, the Baldwin equalized design and the non-equalized design operating on the excellently-built road for which Mr. Brinkerhoff is largely responsible—the Hudson and Manhattan Railroad. If the difference in the riding qualities appears to others as it has to me (and I have heard it frequently referred to by laymen), and if the destructiveness to the roadbed is in proportion to the ease of riding qualities, or in anywhere near a similar proportion, the operating heads of electric lines, urban and interurban, will look with more favor on the fully-equalized type of construction which, I think, is championed by most of the truck builders.

It is undeniably true that the equalizer-bar type of truck is an "old timer," but it is equally true that it involves one of the very few principles of railroad vehicular construction that has stood the test of time.

W. H. HEULINGS, JR., Vice-President.

Higher Fares Are Necessary

THE WILKES-BARRE RAILWAY COMPANY
WILKES-BARRE, PA., May 14, 1917.

To the Editors:

I have noticed with interest the editorials in the ELECTRIC RAILWAY JOURNAL in regard to higher fares. We have remarked in our community that steps must be taken to increase the unit of fare or decrease expenses. The demand will be greater for taxes, cost of materials and cost of labor, with a probable decrease in riding. Therefore, to maintain street railway properties we must let the physical condition fall below a desirable standard or let the service become less frequent in order to make the ledger balance, let alone not making any profit. It does not take very far vision to observe the increase of labor cost and the cost of material within the past two or three years, with the end not yet in sight, and it is the duty of the railways to show the public that they must get away from the old idea that the 5-cent fare must prevail, although very few companies do receive a full 5-cent fare, it being reduced by tickets in some form or another or by a tremendous number of transfers.

There has been no definite decision on the part of this company as to what procedure it will take. Its policy has been, with a considerable degree of frankness, to tell its patrons what it is facing.

We do not think that the trolley interests of Pennsylvania will become hysterical, but they are all facing the same condition in a greater or less degree. Practically every other line of business has advanced its prices, but public utility companies must secure the assent of commissions before they can do that, and we take it that most commissions are composed of business men who can see this situation.

T. A. WRIGHT, Manager.

Practical and Economical Solutions of Problems in

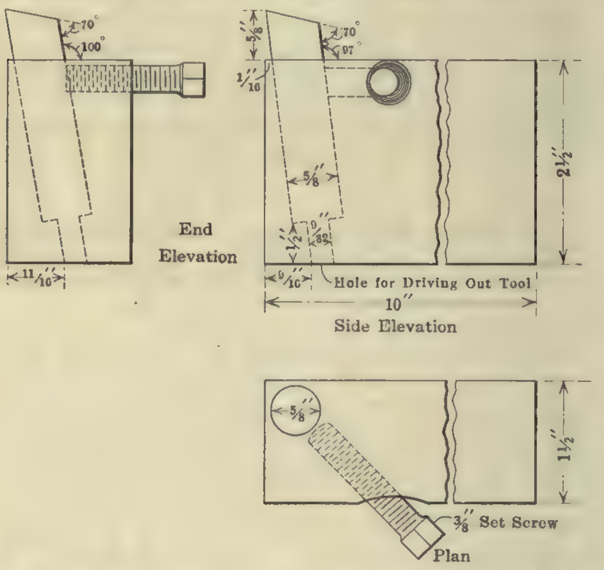
EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Tool Holder for Economical Use of Cutting Steel

BY WALTER S. TITUS
Machinist Auburn & Syracuse Electric Railroad, Auburn, N. Y.

With the present price of high-speed tool steel, economy in the use of it is highly essential. For wheel-turning purposes the writer has designed a tool holder by the use of which a piece of high-speed steel can be worn down to a very short length. The holder is particularly well adapted for use in turning wheels having hard flats, as instead of holding the tool at right angles to the wheel, which allows the tool to spring more or less when entering the hard spots, this tool is held firmly in place in a nearly vertical position. In this way it cuts through the hard spots as easily as through any other part of the tread.



TOOL HOLDER FOR USING UP SMALL PIECES OF HIGH-SPEED STEEL

The points of superiority of this tool holder over the old kind which holds the tool at right angles to the work are as follows: Economy in the use of high-speed steel, economy in grinding away high-speed tool steel, use of the tool steel with its original factory hardening treatment, ability to provide the proper top clearance to the tool, ability to use scrap pieces of high-speed tool steel by forging them to the proper size, and as the tool holder is less expensive, several of them can be made using holes of different depths. This allows one always to have a sharp tool ready, and increases the efficiency and output of the lathe.

It is the practice in many shops to weld pieces of tool steel onto machine steel shanks in order to use up the small pieces, but in using the type of holder described the original cutting tool can be worn down to a very short length and the labor and expense of welding is avoided.

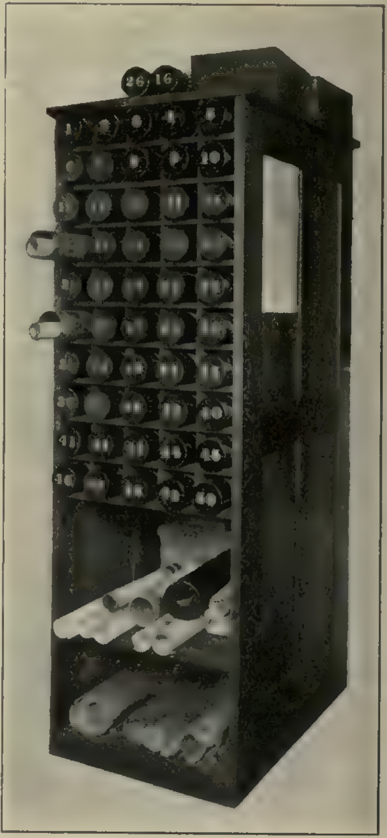
Filing System for Tracings

A Cabinet, Metal Tubes and a Loose-Leaf Record Book Are Used in This Simple Scheme

BY F. J. FOOTE
Master Mechanic Ohio Electric Railway, Columbus, Ohio

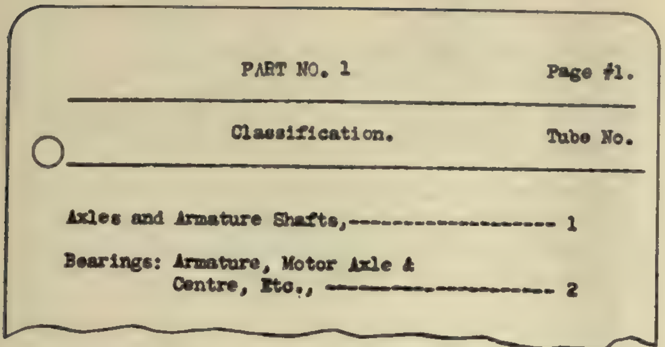
The satisfactory filing of tracings, especially in case there is no filing system being used, and where no money is in sight for an elaborate system, is a subject of great importance to any one who has many tracings in current use. The tube system described below is recommended by the writer as one which has proved adequate and satisfactory under these conditions in the office of the master mechanic of the Ohio Electric Railway. This system is somewhat similar to the one described in the ELECTRIC RAILWAY JOURNAL of March 10, page 449, but differs in several essential points.

Two essential parts compose the system—the filing case and the record book. The photograph shows the filing case (home made) with the tubes containing the tracings in place. There are fifty tubes, each 36 in. long and 3 in. in diameter, and provided with a dustproof cap. Both tube and cap are made of heavy galvanized iron. Each tube is numbered, both on the cap and tube proper. The tracings to be filed are grouped according to any desired classification; each group is then rolled up, fastened with a string or rubber band, and placed in its proper tube. The filing case is 70 in. high, 35 in. deep and 22 in. wide, and the tubes fit loosely in their respective pigeonholes. The tracings are given serial numbers, this numbering having been begun some time before the present filing system was installed.



CABINET AND METAL TUBES FOR FILING TRACINGS

For the record book, an ordinary loose-leaf record is used. This is divided into three parts, as follows: Part 1, giving a list of classifications of the tracings accord-

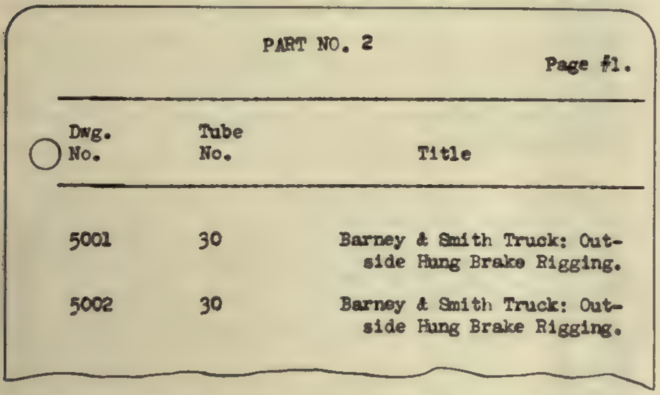


PART NO. 1 Page #1.

Classification.	Tube No.
Axles and Armature Shafts,------------------	1
Bearings: Armature, Motor Axle & Centre, Etc., ------------------	2

RECORD BOOK HEADINGS, SUBJECT CLASSIFICATION

ing to subjects; Part 2, giving a list of all tracings in numerical order, and showing the number of the tube in which each may be found; and Part 3, giving a complete list of tracings to be found in each tube. The advantage of this last part is that by reference to it one can tell at once if a tracing of a particular part exists, and also the tracing number for it.



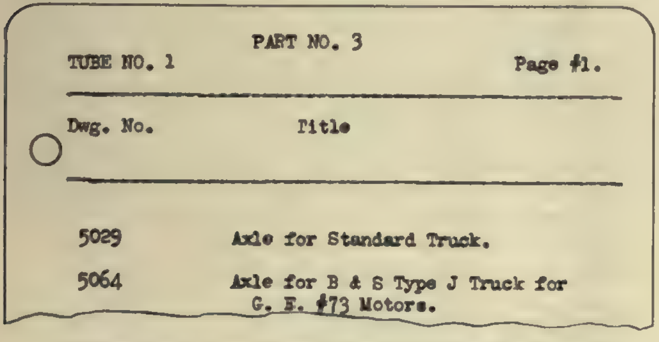
PART NO. 2

Page #1.

Dwg. No.	Tube No.	Title
5001	30	Barney & Smith Truck: Outside Hung Brake Rigging.
5002	30	Barney & Smith Truck: Outside Hung Brake Rigging.

RECORD BOOK HEADINGS, LIST OF TRACINGS ARRANGED SERIALLY

A facsimile of a portion of the first page of each part is shown. It will be noticed that each new tracing filed must be recorded in both Part 2 and Part 3. On the side of the filing case is posted for convenience a classification list which is a duplicate of Part 1 of the record book.



PART NO. 3

TUBE NO. 1 Page #1.

Dwg. No.	Title
5029	Axle for Standard Truck.
5064	Axle for B & S Type J Truck for G. E. #73 Motors.

RECORD BOOK HEADINGS, LIST OF TUBE CONTENTS

The only objection to the system that is of any consequence is that the rolling up and unrolling of the tracings is some little bother. This small disadvantage, however, is more than offset by the low cost, small space occupied, and accessibility of the system.

The Kansas City Western Railway, Leavenworth, Kan., has installed all one-man cars. The city has withdrawn its contest against the reduction in the number of employees, which had been made on the ground that such reduction meant poorer service.

Waste From Coal Mines Used in Seattle, Wash.

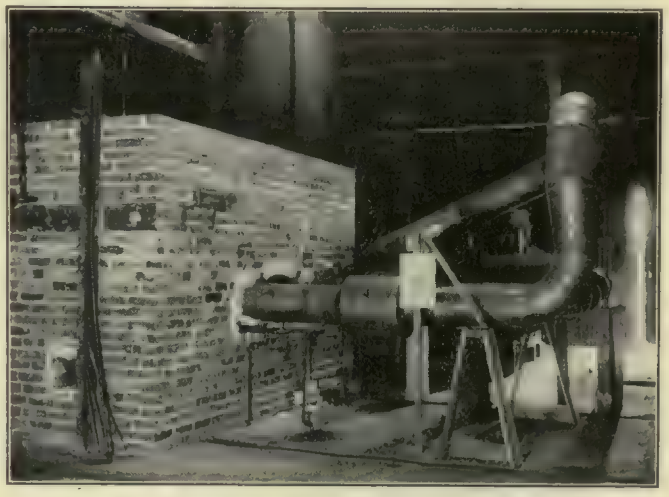
From Experiments Made It Is Practically Assured That Powdered Coal Can Be Readily Burned

BY HENRY HULL

Superintendent Steam Heat Division Puget Sound Traction Light & Power Company, Seattle, Wash.

This company has been experimenting with powdered coal, as there are within a hundred miles of Seattle numerous coal mines with thousands of tons of fine coal piled up which at present is unmarketable and which should be available at slightly above the cost of transportation.

This coal is a lignite variety particularly adapted to use in powdered form due to the high volatile constituent and the very high fusing point of the ash. These characteristics are important inasmuch as a high carbon coal requires fine pulverization and a carefully designed furnace to maintain the high temperature until ignition is complete. And a low fusing ash will, when carried in suspension, cling to the tubes of the boilers, close up the flame space and make its operation impossible.



TEMPORARY ARRANGEMENT FOR BURNING POWDERED COAL UNDER 300-HP. BOILER. SHEET IRON BURNERS AND EXTENDED OVEN ARE SHOWN

To prepare this coal for burning it must first be thoroughly dried and the moisture content reduced to approximately 1 per cent before it can be properly pulverized. It must then be pulverized to powder form, where approximately 85 per cent will pass through a 200 mesh screen and 95 per cent through a 100 mesh screen if the best results are to be obtained. It should then be fed directly to the furnace, or if transportation or storage is necessary it should be kept air tight so far as possible to prevent absorption of moisture. The danger from explosion when handling this material is eliminated, if it is kept in bulk and not allowed to become suspended in a mixture of air. In the latter case a highly explosive atmosphere may be found which will readily ignite if brought in contact with a flame.

The method of experiment and results of test made by the Puget Sound Traction, Light & Power Company are as follows:

The coal is dried and pulverized by the Pacific Coast Coal Company at its briquetting plant, near Renton, which is equipped with a Raymond pulverizing plant. It is then loaded in a special car equipped for the purpose, which consists of a box car in which is constructed a metal-lined hopper. The car is spotted at the steam plant over a chute which is connected to the car by a flexible hose and which feeds a small conveyor encased in a metal housing. The coal is elevated and dumped into a bunker, adjoining the power plant, from the bottom of which it is fed by means of two motor-driven screws into the supply pipe. The coal is then blown through the pipe a distance of 30 ft. to the front of the furnace, where it feeds into specially constructed burners, made of sheet iron, as shown in the accompanying photograph. The air supply to each burner is furnished by a motor driven blower with dampers installed to control the supply. The boiler has been equipped with an extended oven, as shown in picture, in order to furnish sufficient space for the proper ignition and combustion of the fuel.

Results of Test

Duration of test	12.8 hrs.
Average boiler hp. developed	357
Total water evaporated	143,231 lb.
Average temperature of feed water	185 deg. F.
Average steam pressure	106.5 lb. gauge
Average temperature of steam	399 deg. F.
Average flue gas temperature	528 deg. F.
Average draft at uptake	0.17 in. water
Average flue gas analysis	CO_2 17 per cent; oxygen, 2 per cent; CO, 0 per cent
Total coal burned	18,389 lb.
Actual evaporation per lb. of coal	7.8 lb.
Equivalent evaporation from and at 212 deg	8.6 lb.
Boiler efficiency	71 per cent

Above is given a record of a test on the equipment run continuously for 12.8 hours, the duration of the test being determined by the limited facilities for storage and handling of the fuel. The coal was weighed in the car as delivered to the plant and the net weight determined by a subsequent weighing of the car after unloading. The test was run until all coal was consumed. The water was measured by a Venturi water meter installed in an individual feed line to the boiler and all instruments were checked for accuracy before starting. The test was made on a 300-hp. B. & W. boiler on March 23, 1917. The coal analysis is as follows: Moisture, 5.4; volatile, 37.2; fixed carb., 47; ash, 10.4; sulp., 0.56; B.t.u., 11,760.

The ash analysis is as follows: SiO_2, 44; FeO, 10.45; Al_2O_3, 32.88; CaO, 7.75; MgO, 2.40. The screen test gave 5.8 per cent on 100 mesh; 34.6 per cent through 100 on 200, and 59.6 per cent through 200.

It was noted during the test that the boiler could be forced to 200 per cent of rating without any apparent damage to brick setting or tubes. The stack was perfectly clear under these conditions, and there was no fusing of the ash. About one-third of the latter was found deposited in the second and third passes of the boiler. The results of the experiment tend to refute most of the adverse criticism of this method of burning coal. There was no formation of slag in the furnace or on the tubes; there was no shower of cinders and ashes emitted from the smoke stack and there was no damage done the boiler from heavy overload under these conditions.

From its experiments in burning these different fuels the company finds that (assuming pea coal at $1.60 per gross ton) the relative prices of the fuels at which it would have equivalent heating values are as follows:

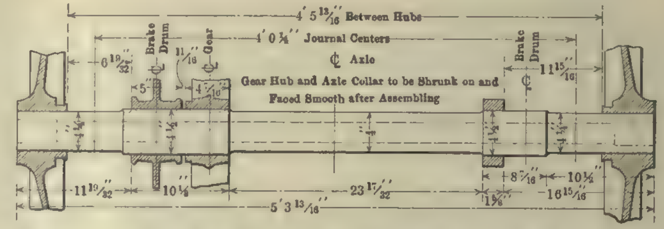
Pea coal on chain grates, at $1.60 per gross ton, delivered.
Fuel oil, at 56 cents per barrel, delivered.
Powdered coal, at $2.20 per gross ton, delivered.

That the powdered coal can be burned without physical difficulty is practically assured, and the company hopes that within a few months the success of its efforts will have been finally demonstrated.

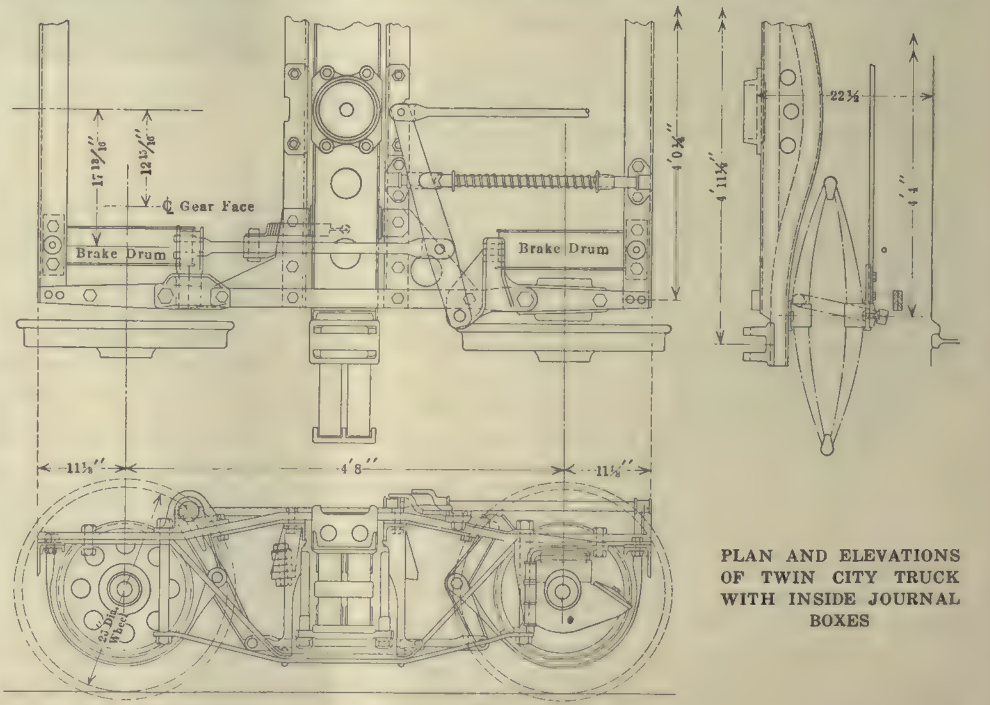
Novel Truck for City Service

This Design, Which Is Being Tried Out by the Twin City Rapid Transit Company, Has Inside Journals and Band Brakes

A novel form of truck for city service has been developed by W. J. Smith, master mechanic Twin City Rapid Transit Company, and has been placed in service on the new light-weight cars that are being tried out on that company's lines. The major features of the construction are inside journal boxes and band brakes, the principal object of the new design being to obtain lighter weight than is practicable where the journals and truck frames are outside of the wheels. By placing the frames between the wheels it becomes possible to use lighter axles, and in addition some of the cross members of the truck can be made shorter and of correspondingly decreased weight.



DETAIL OF AXLE FOR TWIN CITY TRUCK WITH INSIDE JOURNALS



PLAN AND ELEVATIONS OF TWIN CITY TRUCK WITH INSIDE JOURNAL BOXES

An idea of the construction may be obtained from the accompanying illustrations, of which one shows views of the assembled truck and the other a detailed drawing of the axle. From the former it will be observed that the single pedestal casting at each wheel interlocks with one side of the journal box casting. The idea of this construction is to leave one side of the journal box free from bolts and to give access for packing the journal box, whose oil cellar is accessible from the end of the truck and not from the side, as is customary. To provide for movement between the truck frame and the journal box a small amount of play between the interlocked members is permitted. There is a rubber pad on top of the journal box, and this, when compressed, permits the box to slide upward slightly along the pedestal casting, along one side of which it is interlocked.

From experience with the trucks under actual operating conditions Mr. Smith states that this design and location for the journal box appear to be satisfactory in every way. The elliptic springs, which are hung by relatively long links from the transoms and which furnish the sole support for the truck bolsters, are 32 in. long, the length being easily attained by extending the springs out between the wheels. Naturally, the riding qualities of the truck are good.

Band brakes instead of the customary brakeshoes are provided at either side just inside of each wheel, making eight brakes in all. These give a total contact surface of about 800 sq. in. In practice this brake has been found to be efficient, smooth and noiseless.

Complete with wheels and axles the weight of one truck is 3200 lb. The weight of one truck together with two motors and the necessary gear case, oil, grease, etc., to make it ready for operation is 5200 lb. The trucks, it may be said, are being operated under cars that are 9 ft. wide and 46 ft. long.

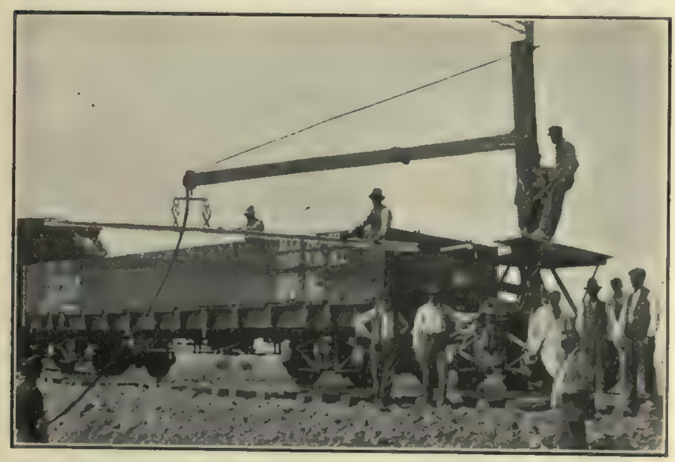
Twenty Men Lay ¾ Mile of Rail Per Day

BY T. W. SHELTON

General Superintendent, Kankakee & Urbana Traction Company, Urbana, Ill.

During the 1916 construction season the Kankakee & Urbana Traction Company built 6 miles of line between Ludlow and Paxton, the grading for which was done during the preceding fall. In this construction a rail-laying machine, designed by the writer, was employed. With this it was possible to unload rail from the car and lay it at the rate of ¾ mile a day with twenty men.

The machine consists of a gib crane mounted on an ordinary steam railroad freight car truck, braced in the manner shown in the accompanying illustration. The crane is hand operated from a platform placed high enough to permit the operator to see all details of the operation plainly. A drawbar and coupler mounted on the crane pillar provide for connecting the crane car to the rail car. The writer has been granted a patent on this machine.

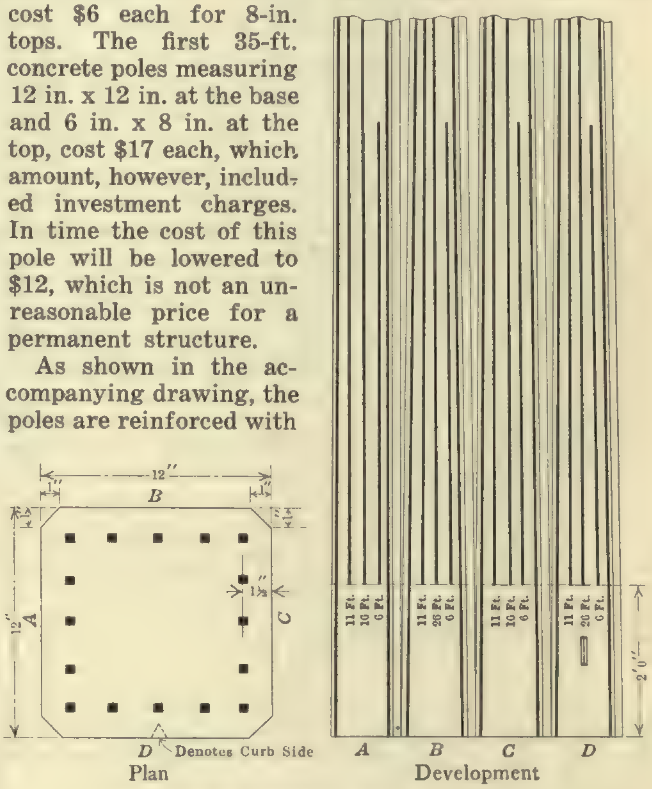


RAIL-LAYING PORTABLE CRANE USED ON KANKAKEE & URBANA TRACTION LINE

Home-Made Reinforced Concrete Poles at Richmond

During 1915, the Virginia Railway & Power Company began to manufacture reinforced concrete poles for situations where both permanence and a good-looking line are desirable. These poles are made in 30-ft. and 35-ft. sizes. They are used in place of Albemarle County chestnut which average twelve years of life (eight years minimum to twenty years maximum) and which cost $6 each for 8-in. tops. The first 35-ft. concrete poles measuring 12 in. x 12 in. at the base and 6 in. x 8 in. at the top, cost $17 each, which amount, however, included investment charges. In time the cost of this pole will be lowered to $12, which is not an unreasonable price for a permanent structure.

As shown in the accompanying drawing, the poles are reinforced with bars ½ in. in diameter, of several lengths, the bars being of Havemeyer upset type. Instead of using lag screws in fixtures, through bolts are used, the holes being cored during forming by means of paper tubes.



Plan Development

DETAILS OF CONCRETE POLE REINFORCING

By March 22, 1917, the company had made up 100 35-ft. poles and forty-two 30-ft. poles at Richmond; also approximately the same number at Petersburg, from the

VIEW OF CONCRETE POLE INSTALLATION, RICHMOND, VA.

same forms. Norfolk has already made 200 35-ft. poles and a third hundred is under way. The company's present pole forms are of wood, but it is planned to make a more durable construction by using a combination of a concrete base and steel sides.

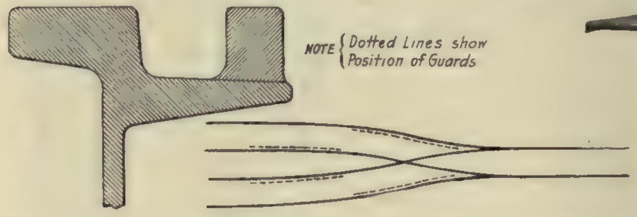
The accompanying illustration shows an installation of concrete poles in Richmond, Va., the poles shown being on Hull Street, between the James River and Seventh Street.

Guard for Tram Rail Made by Electric Welding

BY D. B. MOIST
Chief Engineer, Harrisburg (Pa.) Railways

This company is using 100-lb. tram rail and at a turnout, such as shown in the accompanying illustration, trouble was experienced with the pony wheels of maximum traction trucks leaving the rails. It was therefore decided that a guard was necesary, but instead of installing a separate guard rail, lengths of 1 in. x 1¼ in. mild bar steel were welded to the tram rail, as shown in the accompanying illustration.

A Lincoln welding machine was used, and two men welded the bar to the rail along the four sections in one day without interrupting traffic. Cars have been operating over this turnout for some time since the guards were welded on and no more derailments have occurred. By this means a considerable economy has been effected over the cost of material and labor which would have been necessary if we had had to purchase and install a regular guard rail.



GUARD RAIL WELDED ON TRAM RAIL; TURNOUT ON WHICH RAIL GUARDS WERE USED

Trolley Wheel News from San Francisco

The United Railroads of San Francisco, Cal., has recently changed from 4-in. to 6-in. trolley wheels, weighing 4¼ lb. new and 2 lb. scrapped. It is now making its own wheels, carefully finishing them on the sides to secure good balance. Case-hardened pins and bushings are used with good results. Seven bushings are made out of 1 ft. of steel tubing costing 35 cents, aside from drilling and case-hardening. A test gave the following results.

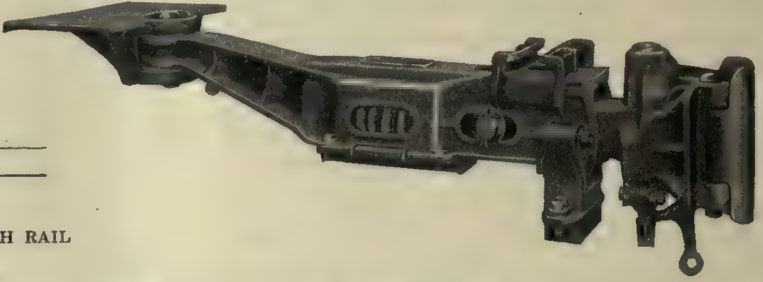
Cold-rolled case-hardened steel pin and case-hardened bushing and wheel installed July 28, 1916, wheel worn out Sept. 4, 1916; second wheel with same pin and bushing installed Sept. 17, 1916, worn out Nov. 4, 1916; third wheel with same bushing but with a tool-steel pin installed Jan. 27, 1917, worn out March 20, 1917; fourth wheel with same bushing and pin installed March 27, 1917, and in use to date. These wheels are used on the San Mateo high-speed interurban cars weighing 76,000 lb. and equipped with four GE-73 motors. The trolley wheel tension is 30 lb.

The trolley base is U. S. No. 6, which has been remodeled by the use of three springs in tandem instead of two.

New M. C. B. Coupler for Interurban Service

A new coupler designed by the Van Dorn Coupler Company, Chicago, Ill., has been brought out to meet the increasing demand which the electric railway companies are facing of interchanging freight equipment with the standard M. C. B. couplers installed on all steam road cars. This new coupler satisfies this requirement and has an added advantage over the standard M. C. B. coupler in that it will permit the operation of cars in trains through city streets where there may be short-radius curves and abrupt changes in grades.

Some of the special features of this new coupler tend to facilitate its use on electric railway systems. The guard arm extending out on the horn side of the coupler and the butting wall on the opposite side and just to the rear of the knuckle produce a "gathering-in" range of several inches more than is found on the usual coupler, and this greatly facilitates coupling on curves. This also helps to align the couplers so that the lock will drop and prevent the knuckles from buckling into the 13 deg. offset of the M. C. B. contour. The coupler shank extends into the forward end of the draft housing and is connected to the spring yoke by means of a 2-in. round pin which extends through to both sides of the yoke and protrudes outside of the draft-gear housing. The coupler head pivots vertically on this pin and is held in alignment by means of a triple head-support which is located in the casing at the forward end of the draft housing. This head-support is so constructed that it adjusts the wear plate upon which the coupler rests to conform to any position of the coupler and thus brings the same bearing area into play at all times. This pivoting of the coupler head permits the couplers to assume the most natural angle and thus allows the knuckles to slide freely the necessary distance, whenever a train of cars is operated over any abrupt change in grade. This freedom from binding relieves the car platforms of abnormal strains. The coupling of cars on uneven tracks without the necessity of bumping them together unduly hard is also made possible through this arrangement, since only part of the weight of the coupler head, instead of the usual full weight of the drawbar, needs to be lifted or depressed in order to produce a vertical alignment of the knuckles.



NEW M. C. B. COUPLER SUITABLE FOR INTERURBAN AND CITY SERVICE

One of the features of this coupler is the construction which gives it a positive lock and at the same time provides that it remain always in the unlocked position even with the knuckle closed, so that trainmen are relieved of the necessity of holding on to the uncoupling rod during the process of uncoupling. The knuckle is thrown wide open upon lifting the lock 4⅝ in.

The coupler carrier is connected with a radial bar and supports the draft-gear housing at its forward end by means of a sliding connection. The couplers are equipped with the Hercules spring draft gear which automatically absorbs the slack between cars of a train.

News of Electric Railways

Traffic and Transportation

Financial and Corporate — Personal Mention — Construction News

Progress in Chicago Situation

City Council Has Taken Several Necessary Preliminary Steps Toward Carrying Out the Traction and Subway Commission Plan

Since the presentation of the Chicago Traction & Subway Commission report early in December, the local transportation committee of the City Council has been almost constantly at work studying the plan recommended by the commission and holding public hearings on it, looking toward the preparation of suitable bills for approval by the Council which could then be sent to the State Legislature for passage. While considerable delay has been brought about by the Socialists and the municipal ownership propagandists in the consideration of these bills, the Council has finally approved bills embodying the principal legislation needed.

On May 9 the Council indorsed, almost unanimously, a so-called "home-rule" bill which is modeled after the State public utilities act and transfers to the City Council the control over service and rates which is now held by the utilities commission. Control over the issuance of securities will, however, still be retained by the commission. The bill if passed will give the city the right to appoint a board of control or commission to carry on the work of regulation. At the last minute an amendment was read into the bill through which the City Council retains the right to recall a member of the commission. Similar bills introduced at previous sessions of the Legislature were lost principally because of the objections from steam railroads and suburban towns surrounding Chicago.

Under the present proposed bill, however, the State Utilities Commission would have authority over any through lines and the local board of control would have jurisdiction over local service and rates. There is still considerable opposition to this bill in the State Assembly, and if it fails in passing it is thought that a home-rule clause will be inserted in the franchise bill which has also been sent to the Legislature on approval of the City Council. If the measure meets with failure here, it will probably mean an end to the whole plan, at least for two years, or until the next session of the Legislature, since practically all other enabling legislation hinges upon local control of the transportation systems. The present Legislature will probably adjourn on June 15.

MERGER BILL APPROVED

A bill providing for the merger of the elevated and the surface lines in Chicago was also approved on May 9 by the City Council, as part of the program outlined by the traction and subway commission. Should this merger bill pass the Legislature and the unification be brought about, it would combine 1049 miles of surface lines and 162 miles of elevated railroad. The purchase price of the surface lines is $451,650,000, while that of the elevated system, according to the traction and subway commission's evaluation, is $70,400,000. This bill permits the consolidation of street railways and a "local railroad," the latter name having been adopted to differentiate between the elevated and steam railroads. One feature of the bill is a clause which provides that any stockholder who does not acquiesce in the consolidation scheme may file a court petition stating his disapproval, and that he shall become obliged to sell his holdings to the new corporation at a price fixed by the court. The vote of the City Council approving this merger bill was fifty-one to fifteen.

FRANCHISE BILL APPROVED

The traction and subway commission report recommended the adoption of an indeterminate franchise, but this was attacked, principally on the ground that it was virtually a perpetual franchise. In the commission's report it was pointed out that this type of franchise, granting as it did the right to use the city streets as long as the company complied with the requirements of good service which might be dictated by a board of control, could never be gained until the State constitution was so amended as to give the city the financial ability to exercise its right to take over the transportation systems. Until it has that right, the city will be without means of enforcing regulatory measures.

STRAIGHT THIRTY-YEAR FRANCHISE APPROVED

The commissioners and railway officials thought that a fifty-year franchise was necessary in order to carry out the construction program. It was impossible, however, to get much consideration from the Aldermen for a franchise of this term at the present time. Several weeks ago the Council voted down a thirty-twenty-year franchise bill which provided that the city could take over the property at any time upon paying the agreed purchase price, or could take it over at the end of thirty years without paying the full price but by assuring interest payment on the unamortized portion of the investment. This was objected to as a fifty-year franchise in disguise. Finally, on May 9, a straight thirty-year franchise bill was approved by a vote of forty-three to twenty-four and sent to the State Legislature, the city not having the right to grant a franchise in excess of twenty years. This franchise bill is made inapplicable to other cities in the State. The bill allows the city to take over the transportation companies at any time on the payment of the purchase price, and also provides for amortization of the investment. It further provides that at the end of thirty years, the city may take over the property subject to a lien on the earnings which are to be used for the payment of interest on outstanding securities, but the city shall not assume to pay the principal thereof. It is expected that the earnings of the property will be great enough to pay interest on the securities and provide for the amortization fund, so that in another twenty years beyond the thirty-year franchise period the city would automatically acquire full title to the property.

In order to remove the doubt expressed by counsel as to the right of the city to construct and own subways, a bill covering this matter was approved by the City Council on May 9 for transmittal to the State Legislature.

All bills recommended to the Legislature in connection with the traction program contemplate that no ordinance in connection with them shall go into effect until after a referendum vote at some regular or special election. If the whole program is passed by the State Legislature, and the ordinances are drawn up and agreed upon, popular approval will be sought at the November election this year or the April, 1918, election.

FURTHER PROGRESS DEPENDS UPON LEGISLATURE

Further progress in the solution of the Chicago traction situation now depends on the action of the Legislature. With passage of the proposed bills, the bigger problem of drafting a working ordinance still remains to be done. Many of the Aldermen have approved the present bills with the understanding that in the formulation of the ordinance there will be opportunity for further hearing and working out of many objectionable points. With the railway men favoring consolidation and believing that the financing may be accomplished on a thirty-year franchise grant provided the present construction expenditure outlined by the traction and subway commission is rearranged, or at least is not increased for the first period of the program, it is possible that a settlement may be reached in another year.

Middlesex Wage Decision

Arbitrators Who Considered Wages on Middlesex & Boston Street Railway Praise Company Management

The arbitration committee appointed to consider the matter of wages for the employees of the Middlesex & Boston Street Railway, which operates 130 miles of line in Massachusetts, has reported its finding. The board recommends an increase of approximately 10 per cent in the wages of the trainmen of the company and a proportionate increase in the wages paid to carhouse men and other employees. Among the other questions which the board had before it for settlement was whether the award should terminate on July 1, 1919, or on some date before that time. On this point the board ruled that the award shall terminate on July 1, 1919.

CONTENTIONS OF MEN AND COMPANY

The contention of the men before the arbitration board was that the wages should be increased to the same extent that the cost of living has increased since the last award, which was on June 23, 1914. The company contended that the wages should not be increased at this time because (a) its financial condition was such that any increase would prevent the payment of dividends to stockholders and impair the ability of the company to make necessary expenditures for maintenance, and (b) the increase in the cost of living since the last award was due in part to extraordinary and temporary conditions resulting from the war.

As regards the objection of the company the board expressed the opinion that the limitation upon the income of the employer in this instance was one largely within the control of the Public Service Commission. It stated that obviously public interest required a continuation of the public service rendered by the railway and that continuation of this public service ought not to be allowed to go on at a loss either to the owners or to the operatives. The board said further that the most careful scrutiny of the history, organization and management of the company had convinced it that the company was and had been most economically and efficiently managed and had been extremely conservative in the payment of salaries to executives. It was also clear beyond the slightest doubt that the present straightened financial condition of the company was not due in any measure to extravagance or lack of efficiency. On this point the board said: "It does not seem possible that any company could be better or more thriftily conducted."

The board also expressed its appreciation of the proposition of the company that the stockholders were entitled to dividends which should represent a living wage for their invested capital. The board said that the necessity was immediate and insistent for providing public service corporations with means to pay adequate wages to men upon whose continued employment and experience safe operation depended. In this connection the board said: "In establishing what we believe to be a no more than adequate scale of wages, we have in mind the declarations of the Public Service Commission in the Middlesex & Boston rate case, and we earnestly emphasize our conviction that it is essential that relief be granted to the company."

WHAT THE NEW SCALE MEANS

At present the weighted average wage of the blue uniform men amounts to 27.986 cents an hour. The board said that an increase of 9.311 per cent would produce a weighted average wage of 30.592 an hour, or an increase of 2.606 cents per hour. Applying the factor 9.311 to the present wage scale and using as a basis the conditions as to employment as they existed in the year 1916-1917, the scale for the year which will end July 1, 1917, is as follows: first year, 26 cents; second year, 28 cents; third year, 30 cents; fourth year, 32 cents; fifth year, 33 cents. For the period which ends July 1, 1918, the award is as follows: first year, 27 cents; second year, 29 cents; third year, 31 cents; fourth year, 33 cents; fifth year, 34 cents. For the third period, that which will end on July 1, 1919, the schedule adopted is as follows: first year, 27.5 cents; second year, 29.5 cents; third year, 31.5 cents; fourth year, 33.5 cents; fifth year, 34.5 cents.

The board said that the same reason which dictated an increase in the rate of wages made to the blue uniform men also required a proportionate increase in the wages made to the carhouse men and other employees. The board found, however, that it was not practicable to adopt a graduated scale for carhouse men and other employees and established schedules for these men proportionate to those granted to the trainmen. The present rate of pay for carhouse and other miscellaneous employees exclusive of trackmen and track oilers ranges from 20 to 35 cents an hour. The award raises the foregoing to maxima of 23 and 40 cents an hour for the 1918-1919 period. Trackmen receive from 25 to 29 cents an hour at present and are to receive 28.75 to 33.5 cents maximum under the award. Track oilers, receiving 20 to 25 cents, will be increased in the final year to 23 to 28.75 cents. The board held that the financial condition of the company is such that it ought not to pay for any unnecessary time, in passing upon the question whether all regular runs should pay at least nine hours' wages. Moreover, the practical difficulty which rendered it inadvisable to grant a graduated scale of wages for carhouse men and other employees also rendered it undesirable to establish a minimum wage for such employees.

COMPANY REPRESENTATIVE DISSENTS

A minority report by A. A. Ballantine, on behalf of the company, dissented from the wage increase because the award raises the wages beyond the ability of the company to pay. Experience since the award of 1914 showed that despite the increase of fares granted by the Public Service Commission the additional revenue had been insufficient to pay the increased wages and expenses of the company and maintain the former 4 per cent return on its stock. For the year ended June 30, 1916, the dividend had to be reduced to 3.25 per cent. The award now made for the current year wiped out more than half the amount needed to maintain even that insufficient rate. Even if the Public Service Commission allowed the company to increase its charges it was doubtful whether the company could secure from its business under present conditions revenue sufficient to meet its expenses, including wages at the rates now prescribed, and permit anything like a fair return upon the investment.

The award was signed by Henry C. Sawyer, chairman, and James H. Vahey, representing a majority of the board.

Rails Removed at Night

Four blocks of rails of the double-track street railway on McGee Street, Kansas City, Mo., were torn up between midnight and 6 o'clock of the morning of April 10, by a squad of workmen commanded by Fred A. Richardson, street commissioner. Mr. Richardson was acting under written instructions from Mayor Edwards. The plan of rerouting cars which have used this street will now be put into effect according to a routing ordinance passed several months ago. The night removal of the rails was planned to avoid the securing of an injunction by business men who opposed traffic being diminished on this thoroughfare.

The city and the Kansas City Railways had agreed some time ago on the removal of the tracks in the four blocks and on the rerouting of cars, involving the construction of a short track and new curves. The Kansas City Railways last November began the work of removing the rails, but was stopped by an injunction issued by the Circuit Court of the county. The injunction read against "The Kansas City Railways and John Doe."

The Kansas City Railways has been held in contempt of court for its alleged part in tearing up the McGee Street tracks and has been ordered to replace the tracks within sixty days. The court withheld action on the motion to cite Mayor Edwards for contempt. The judge intimated, however, that the disposition of the Mayor's case would depend largely on his activity in assisting the railway in replacing the tracks. It was shown that there had been conferences between the railway officials and the city, presumably on the subject of the track removal. The court found that the contractor who assisted was in the position of an agent of the company; that the cars were routed elsewhere after the tearing-up began, and that the company furnished a work car. The company will appeal to a higher court.

Strike on I. U. T. Line

Brotherhoods Fail in Attempt to Tie Up Lines of the Indiana Union Traction Company

Efforts on the part of the Brotherhood of Locomotive Engineers and the Order of Railway Conductors to organize the trainmen of the Union Traction Company of Indiana, which have been in progress for several weeks past, resulted in about thirty-six interurban trainmen walking out on Sunday morning, May 13, in response to a strike call made by the brotherhoods. About 200 trainmen refused to respond to the call, so that while the schedules on some divisions were affected for a time the interruption to service was not serious. The schedules of the main lines of the company, operating out of Indianapolis to Anderson, Muncie, Newcastle, Kokomo, etc., were maintained, and extra train service was provided between Indianapolis and Fort Benjamin Harrison, where the training camp of the officers' reserve corps is established.

The employees of the city lines of the Union Traction Company in Anderson, Marion and Muncie were not affected by the strike. In these cities, however, mass meetings were planned for May 14 to try to arouse sympathy for the striking trainmen, and full-page advertisements were inserted in the principal newspapers submitting the case of the employees to the people.

CONTENTION OF THE BROTHERHOOD

The brotherhoods claim that the present trouble arises from the discharge of interurban trainmen of the Union Traction Company in March, 1917, on account of their activity in attempting to induce other employees to affiliate with the Order of Railway Conductors and the Brotherhood of Locomotive Engineers. An attempt was made early in April by officers of the two brotherhoods to confer with H. A. Nicholl, general manager of the company, but Mr. Nicholl declined to concede the right of the brotherhoods to represent the discharged employees and refused to meet them. The brotherhood officers then submitted the matter to W. L. Chambers, Commissioner of the United States Board of Mediation and Conciliation. They asked for mediation under the Newlands act, and stated their reluctance to distribute strike ballots in view of the published policy of the National Council of Defense.

On April 11 Judge Chambers conferred with F. A. Burgess and T. A. Gregg, representing the brotherhoods, and also with Arthur W. Brady, president of the Union Traction Company of Indiana, but was unable to bring about any joint conference. Judge Chambers notified the brotherhood officers that Mr. Brady declined to meet them on the ground that his company did not recognize organized labor and he saw no reason to change its policy.

PRESIDENT BRADY STATES COMPANY'S CASE

Mr. Brady wrote to Judge Chambers on April 13 confirming an offer which he had made at their conference, that on individual application by any of the discharged motormen and conductors the causes of their discharge would be reviewed by Mr. Nicholl, general manager, or Mr. Brady, or both, and if any of the men should not be reinstated, Mr. Brady would then take under consideration the question of submitting the case to arbitration in the manner provided by the Newlands mediation act of July 15, 1913. Mr. Brady then called attention to the fact that twenty-four trainmen were discharged early in March and that no request for a review of their cases had been made by any of the discharged men or by their fellow employees, nor had any committee of employees presented any statement of grievances. He said, however, that on April 12 a paper was circulated among all the interurban trainmen to ascertain their views as to desirability of membership in the two brotherhoods. This was signed by 216 of the men. Eighty per cent of the men went on record as against any change of working relations with the company, and only two men did not sign the paper.

The controversy was the subject of considerable discussion and correspondence between W. L. Chambers and Daniel Willard, president, and Walter S. Gifford, director, of the National Council of Defense, and L. S. Storrs, president of the American Electric Railway Association, and was referred in a communication to Newton D. Baker, Secretary of War, in an attempt to remove any misunderstanding of the statement of the National Council of Defense when it advised "that neither employers nor employees shall endeavor to take advantage of the country's necessities to change existing standards."

On May 2 Judge Chambers wrote to Mr. Brady, renewing the offer of the Board of Mediation and Conciliation to arbitrate the differences between the discharged men and the company. Mr. Brady replied on May 4, expressing his appreciation of the courtesies extended, and closed by saying: "Our relations with our employees remain cordial and satisfactory and events since your trip to Indiana convince me that the instruments signed at that time by practically all our motormen and conductors express their genuine and sincere sentiments and intentions. Further agitation of the subject cannot be in the public interest and is manifestly undesired by our employees."

On May 12 T. A. Gregg, vice-president of the Order of Conductors, and F. A. Burgess, assistant grand chief of the Brotherhood of Locomotive Engineers, in a communication to Mr. Brady announced that, having failed to reach an amicable adjustment of the differences, a strike would become effective at 4 a. m. on May 13.

On May 15 officials of the Union Traction Company notified the striking trainmen that they must apply individually for reinstatement before noon on May 16 in order to receive consideration. The superintendent at Marion announced on the evening of May 16 that sixteen men reported for work under the company's conditions. Other striking trainmen declared they would hold out for recognition as members of brotherhoods and stated that there were no further desertions from their ranks. The company reports that practically regular schedules are being operated on the system and that all passenger and freight schedules were normal on May 18.

Preparing for Cincinnati Work

A partial organization of the working force to prepare plans and specifications for the proposed rapid-transit loop at Cincinnati, Ohio, was effected at a meeting of the Rapid Transit Commission on April 4. Frank L. Raschig was appointed principal assistant engineer at a salary of $5,000 a year, while J. R. Biedinger, F. F. McMinn and P. R. Kirstein were appointed designing engineers at salaries ranging from $2,100 to $2,400 a year. H. C. Kleemeier was appointed assistant engineer and W. C. Boone was appointed draftsman. All these men were associated with Frank S. Krug, chief engineer, in his office as city engineer. Departments will be combined and their places will not be filled in the city office for the present.

The commission has approved the answer to the petition of David S. Oliver, who as a taxpayer recently brought an injunction suit against the city and the commission to prevent the construction of the loop. The answer of the commission will be filed in court at once. The commission denies all the allegations contained in the plaintiff's petition.

MAYOR TO SUPERVISE FARE AND TRANSFER PROBLEM

At a conference on May 9, in which the members of the Rapid Transit Commission, Mayor Puchta, City Solicitor Groom, Chief Engineer Frank S. Krug and former Mayor Frederick S. Spiegel took part, it was decided that the Mayor should have supervision over the fare and transfer question and pending and proposed construction of the surface lines. The members of the Rapid Transit Commission are to devote their attention wholly to the construction of the rapid transit loop. Mayor Puchta has been authorized to ascertain the course to be followed in making an appropriation for the payment of a street railway commissioner. Until this is done no commissioner will be appointed.

In connection with the proposed universal transfer system, which was intended to go into effect on May 15, Mayor Puchta stated that he would have authority to amend the schedule after it is approved, if found necessary. It must provide for transportation from one point to another by the shortest possible route at a fare of 5 cents. The 5-cent fare on the Millcreek Valley route, under the provisions of the new franchise, was to have gone into effect on May 15.

Municipal Men Get Increase

At a conference of the Mayor and city officials of San Francisco, Cal., on April 27, it was unanimously voted to increase the pay of all car and platform men, trackmen and repairmen of the San Francisco Municipal Railway 5 cents an hour, or 40 cents a day. The conference was presided over by Supervisor Wolfe and was participated in by Mayor James Rolph, Jr., President Reardon of the Board of Public Works, Superintendent T. A. Cashin of the Municipal Railway, and members of the committees on finance and public utility of the Board of Supervisors. The decision was expressly based upon two grounds, first that it is now virtually impossible for a workingman to live in San Francisco on a wage of $3 a day; and second, that the municipal railway of San Francisco has proved such a financial success that there is no plausible reason for denying a living wage to its employees.

On May 7 the Board of Works passed a resolution recommending that the employees of the municipal street railway receive an increase in pay of 50 cents a day. The question was then referred to the Board of Supervisors' finance committee.

Superintendent Cashin explained that the proposed wage increase will amount to about $93,000 a year. Originally he figured on an increase of 5 cents an hour, which for an eight-hour day would amount to 40 cents a day. This he estimated would cost $78,000 a year. President Reardon of the Board of Works said that whether this money shall come by reduction of the 18 per cent of the gross earnings that have been set aside for depreciation, redemptions and bonds, or out of the tax levy, is a matter for the Supervisors to decide.

Wage Increase in Chattanooga.

The trainmen in the employ of the Chattanooga Railway & Light Company, which operates in the city and vicinity, asked for an increase in wages of 1 cent an hour. The present minimum is 19 cents and the maximum 26 cents for the fifth year. On Oct. 7, 1916, the company made a new working agreement with its men to be effective for one and one-half years. This agreement was on the open-shop basis. Arbitration was provided as a means of adjusting wages only in the event the company did not increase the wages prior to April 7, 1917, or within six months of the date of signing the new agreement. Prior to April 1 an advance of 1 cent an hour was announced by the company. The men were not satisfied with this increase and demanded arbitration. This was declined by the company in view of the fact that the advance was made within six months of the execution of the agreement, thus complying in full with the statement and terms of the agreement. The company has notified its employees that they will receive another increase as soon as the earnings justify it.

Negotiations Continued at East St. Louis.—The conferences between the officers of the East St. Louis & Suburban Railway, East St. Louis, Ill., and the trainmen of the company over the working conditions of a new contract to take the place of the one that expired on May 1 were still being held on May 17.

Strike on Cincinnati Interurban Line Settled.—The motormen and conductors on the Cincinnati, Georgetown & Portsmouth Railway returned to work on May 11 after the company had signed an agreement recognizing the union and reinstating the president of the local branch of the union. The strike lasted about a week.

Strike in McAlester Ended.—The strike of motormen and conductors on the Pittsburg County Railway, McAlester, Okla., has been ended and the men have returned to work. The trainmen demanded a wage increase of 4 cents an hour, and the company offered an advance of 2 cents. A compromise was reached on an advance of 3 cents an hour for all motormen and conductors.

State Mediators Called.—George F. Miles and Ralph Maxwell, State mediators, went to Alliance, Ohio, on May 10 to aid in the settlement of a strike of motormen and conductors on the Stark Electric Railroad and the Cleveland, Alliance & Mahoning Valley Railway. The men quit work on the refusal of the company to increase their wages 5 cents an hour and recognize their union. They had been out several days when the mediators interceded.

Rhode Island Valuation Report Presented to State.—The special State committee appointed to investigate the financial affairs of the Rhode Island Company has held a conference with the federal trustees in charge of that property, and has received from them a complete report on the valuation of the company's physical plant, taken during the past few months by the company. Chairman Zenas W. Bliss states that this report will be the basis of the State investigation. The contents of the report have not yet been made public. The formal hearings have not been scheduled.

Utah Interurban Men Seek Increase.—The trainmen in the service of the Ogden, Logan & Idaho Railway, Ogden, Utah, have a contract with the company which expired on May 15. Their pay under this contract has been 25 cents an hour for the first two years, 27½ cents for the next two and 30 cents after four years. The men are seeking an advance over these rates. They have granted William H. Whitney, the new general manager of the company, an additional four weeks in which to reply to their request.

Wage Increase Without Change of Contract.—On account of the increased cost of living, the Aurora, Plainfield & Joliet Railway, Joliet, Ill., has voluntarily decided to pay all trainmen an additional 2 cents per-hour wage, until further notice. This increase is not to affect the terms of the company's contract with the men, which runs until July 31, 1918, and the company reserves the right to resume the wage scale provided in the contract at any time. Carhouse men, trackmen, linemen, substation men, dispatchers, agents, and office and park employees have also received an increase in proportion to the trainmen.

New Working Agreement in Salt Lake City.—Articles covering a new labor agreement between the Utah Light & Traction Company, Salt Lake City, Utah, and employees were agreed to recently at the conclusion of a conference of several days between H. F. Dicke, general manager of the company, and a committee of seven, representing all the trades in the company's service. It is stated that the new contract does not differ materially in its terms from the old one, but that the conditions which in future will govern the relations of the men and the company will not be made public until the agreement has been ratified by the men.

Full Service in South Bend.—Full operation of cars continues without interruption on the lines of the Chicago, South Bend & Northern Indiana Railway in South Bend. Governor Goodrich advised the union officials that the company had informed him in a letter from General Manager Hardy that the men had received an opportunity to return to work; that all schedules and lines were in operation, and that the company could not accept the offices of any board of arbitration. Therefore he could not appoint such a board. A delegation of the strikers called on the Governor late on the afternoon of May 16, however, and again urged the appointment of a board of conciliation.

Increase in Wages in Los Angeles.—Howard Huntington, general manager of the Los Angeles (Cal.) Railway Corporation, on May 4 ordered the pay of the trainmen raised approximately 7½ per cent, the raise to be effective immediately. This raise will increase the company's payroll $120,000 a year and was made because of the increase in living cost. In addition to the present 7½ per cent increase it was announced that an additional increase of 7½ per cent will be paid the men if the jitney bus competition is curbed. This additional raise will, if the railway men are successful in their initiative petition against the jitneys, mentioned previously in the Electric Railway Journal, mean an additional expense of $120,000 annually to the company.

Tripper Arbitration for New York State Railways.—Resort will be had to arbitration to settle the differences between the New York State Railways, Syracuse, Utica and Rochester lines, and the Amalgamated Association of Street & Electric Railway Employees in the matter of adjusting the tripper scale of pay on those lines. Under present conditions, union officials say these men are able to put in not more than six hours daily. They have asked that all time under six hours and over four hours be rated at six hours, and all time over six hours and under nine hours be rated as a full day. It is understood that the Amalgamated men have submitted the name of their arbitrator to the railway officials and that the entire mediation committee will be announced and a hearing held soon.

Suit for Failure to Pave Right-of-Way.—The Commissioners of Franklin County, Ohio, have filed suit against the Columbus Railway, Power & Light Company for $230,000 damages, because of the alleged refusal of the company to pave its right-of-way on Harbor Road. The petition alleges that the county must do the work at a cost of $180,000 and that because of this refusal the contractor now refuses to do the county's share at the original figures and the county will be compelled to pay $25,000 more on account of the increase in the price of materials. In addition it is claimed that property owners suffered damage to the extent of $25,000 because of the delay. The company's franchise will expire in June and it declared that if a new franchise was not granted it would be compelled to remove the Westerville track and discontinue service.

Increase in Wages in Seattle.—For the second time this year the wages of the trainmen in the employ of the Seattle division of the Puget Sound Traction, Light & Power Company have been raised, and the increase has been made retroactive. Last January, when the company announced an increase of 1 cent an hour, it was stated that another increase of 1 cent an hour would be put into effect on July 1 of this year. The recent order, however, makes the promised increase take effect on May 1. Two other changes are made that were not contemplated in the order of Jan. 1. Trainmen while breaking in students will receive henceforth 2½ cents an hour extra, whereas the extra pay of men serving as instructors has been 1 cent an hour. Hitherto the newly employed trainmen have been receiving a minimum wage of $55 a month. Hereafter the lowest wage paid by the company to its trainmen will be $65 a month. The increase in pay now in effect will add about $43,000 annually to the operating expense of the company. Speaking of the increase in wages, G. A. Richardson, general superintendent of railways, said, "The changes are made at this time on account of the increased cost of living, caused by war conditions, which were not anticipated when the order of January was posted."

Programs of Association Meetings

Iowa Electric Railway Association

The annual convention of the Iowa Electric Railway Association, arranged to be held at Des Moines, Iowa, on May 24 and 25, has been postponed for a year.

Illinois Electric Railway Association

The regular meeting of the Illinois Electric Railway Association which was to have been held on May 18 in Chicago was called off owing to the present uncertain conditions.

American Society of Mechanical Engineers

The spring meeting of the American Society of Mechanical Engineers will be held in Cincinnati, Ohio, May 21 to 24. The program reveals two important features of this meeting—sessions on munitions manufacture and a joint session with the National Machine Tool Builders' Association.

New England Street Railway Club

For the next regular meeting of the New England Street Railway Club at the Hotel Brunswick, Boston, Mass., on May 24 the principal speaker of the evening will be Charles F. Weed, president of the Boston Chamber of Commerce, Boston, Mass. Mr. Weed is vice-chairman of the executive committee of the committee on public safety, and has made a thorough study of the needs of the country under war conditions. His subject will be "New England's Part in Preparedness." There will also be heard a few words from some of the distinguished military and naval men, who will be present as guests.

Financial and Corporate

The War and the Utilities

Decline in Security Prices Causes Comment—Increased Fare Proposals Should Serve to Reassure Holders

With respect to the prices of public utility and other investment securities, the times are sadly out of joint, as Shakespeare has said,—so sadly so that at the time this was written the quotations of many of the standard utility and railroad issues dealt in on the exchanges were at or below the levels reached in the panic of 1907. The liquidation of high-class investment issues Boersianer in the Chicago *American* ascribes to the fear of imprudent economic legislation. According to him investors preferred to exchange their holdings for what Disraeli called the "sweet simplicity of the 3½ per cents."

Managers are interested in the subject of the effect on their credit caused by an era of decline in security prices such as the present, and one of them, Samuel Insull of the Commonwealth Edison Company, Chicago, has raised his voice in behalf of the utilities. He says that the depression in prices is unwarranted. While he admits that expenses are high, in speaking more particularly about the Commonwealth Edison Company, the People's Gas Company, the Public Service Company and the Middle West Utilities Company, he says they are by no means so extreme as to have warranted the depreciation in the price of the general run of utility securities. Another authority has urged the holders of utility stock to retain their securities as it is only a question of time when the situation will right itself.

All connected with the industry should take their cue from the recent remarks of President Sullivan of the Bay State Street Railway and do what they can to drive home the imperative need of the service which they render. Many electric light, power and gas companies already have wonderful merchandising organizations, but for the vast majority of these companies only the surface of business has been scratched. There is nothing spectacular in prospect for the holders of the securities of such companies, but there is something much more important in view from the standpoint of the conservative investor—a steady, consistent increase in business which has back of it a real need on the part of the general public.

What intensive merchandising methods can accomplish for the electric railway, however, is still an unsettled problem. Earnings of utilities are unusually stable, irrespective of whether financial conditions are good or bad. This applies in a large measure to the electric railways as well as other utilities, but the electric railways are handicapped as compared with the electric light, power and gas companies because they do not respond in anything like a similar ratio to quickened commercial activity.

While the declines in the prices of many issues dealt in on the exchanges have called for comment from Mr. Insull and others, investment houses that specialize in utility issues report no undue liquidation. This is true not only in New York, but in New England and in other centers where such issues are disposed of direct to the public over the counter. The utilities have on the whole built well for the future, and with a return to normal of many things that enter into their operation the increases in gross that many of the combined railway and lighting companies are enjoying and are likely to continue to enjoy will loom large.

There is no mistaking the fact, however, that many electric railways are finding it increasingly difficult to make ends meet. Relief has already been granted by the regulating bodies in a number of cases, and applications are under way for other measures that will serve to augment the earnings of these companies without being unduly burdensome to the users of the service. These efforts should serve not to quicken liquidation, but to reassure holders of securities that their interests are being carefully safeguarded.

Annual Reports

Hudson & Manhattan Railroad

The comparative income statement of the Hudson & Manhattan Railroad, New York, N. Y., for the two years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Passenger revenues	$3,822,578	93.6	$3,477,695	93.3
Miscellaneous revenues from railroad operations	262,270	6.4	248,294	6.7
Total railroad revenue	$4,084,848	100.0	$3,725,989	100.0
Maintenance of way and structures	$268,061	6.5	$269,424	7.2
Maintenance of equipment	219,179	5.4	179,676	4.8
Power	275,986	6.8	243,509	6.5
Transportation expenses	679,464	16.6	615,303	16.5
Traffic expenses	3,308	0.1	1,110	0.6
General expenses	176,636	4.3	147,574	4.0
Total railroad operating expenses	$1,622,634	39.7	$1,456,596	39.1
Net railroad operating revenue	$2,462,214	60.3	$2,269,393	60.9
Railroad taxes	293,610	7.1	272,237	7.3
Net railroad income	$2,168,604	53.2	$1,997,156	53.6
Net income from outside operations	918,077	22.5	982,627	26.4
Total operating income	$3,086,681	75.7	$2,979,783	80.0
Non-operating income	55,398	1.3	43.111	1.1
Gross income	$3,142,079	77.0	$3,022,895	81.1
Income deductions prior to bond interest	264,582	6.5	243,765	6.5
Net income applicable to bond interest	$2,877,537	70.5	$2,779,130	74.6
Bond interest on N. Y. & J. 5's, first mortgage 4½'s and first refunding 5's	2,155,402	52.8	2,137,998	57.4
Net income available for income bond interest	$722,135	17.7	$641,132	17.2

The growth of traffic which began to manifest itself in the fall of 1915 continued steadily throughout 1916, the increase in the number of passengers carried during the year being 6,268,438, or about 10.5 per cent. Of this increase, 4,682,540 passengers (13.1 per cent) represents the growth in the downtown traffic and 1,585,898 (6.6 per cent) in the uptown traffic. The passenger revenue increased $344,882 or 9.9 per cent, while other items showed the following changes: Advertising, a decrease of $8,778 or 7.1 per cent; other car and station privileges, an increase of $4,582 or 6.6 per cent; sale of power, an increase of $8,608 or 71.2 per cent; miscellaneous revenue other than transportation, an increase of $12,379 or 40.5 per cent, and miscellaneous transportation revenue, a decrease of $3,014 or 19.5 per cent. The net effect on operating revenues was a gain of $358,859 or 9.6 per cent.

During 1916 the company experienced unavoidable increases in the cost of operation. These became most noticeable in the later months of the year, and were the result principally of wage increases and fuel shortage. The total operating expenses rose $166,038 or 11.4 per cent. All sections of the expense group, with the exception of maintenance of way and structures (which decreased $1,363 or 0.5 per cent), showed increases, as follows: Maintenance of equipment, $39,502 or 22.0 per cent; power, $32,477 or 13.3 per cent; transportation, $64,161 or 10.4 per cent; traffic, $2,197 or 197.9 per cent, and general, $29,062 or 19.7 per cent. As a result the gain in net operating revenue was cut to $192,821 or 8.5 per cent.

After careful study the board of directors reached the conclusion that it was in the interest of the company and of its security holders to considerably strengthen itself financially, so that it might be fortified against any contingencies. The report of Stone & Webster, noted in the ELECTRIC RAILWAY JOURNAL of March 3, confirmed the judgment of the directors that it was urgently necessary promptly to attain an adequate cash reserve—at least $1,000,000, their report said. Therefore, on Feb. 26 an appropriation of $340,000 was made to the reserve account for the period ended Dec. 31, 1916. An initial appropriation of $50,000 to this reserve had been made as of June 30, 1916, making the total appropriated $390,000. As this appropriation absorbed the surplus earnings of the company for the period ended Dec. 31, 1916, no distribution of interest upon the adjustment income bonds was made on April 1 for the last six months of 1916. For the first six months $331,020 had been paid. The surplus balance carried forward to 1917 was $51,359.

The following table gives some comparative statistics for the last two calendar years:

	1916	1915
Passenger revenue per revenue car mile	$0.4696	$0.4456
Gross railroad operating revenue per revenue car mile	0.5018	0.4774
Operating expenses (excluding taxes) per revenue car mile	0.1993	0.1866
Net railroad operating revenue per revenue car mile	0.3025	0.2908
Passenger revenue per passenger	0.0578	0.0580
Gross railroad operating revenue per passenger	0.0617	0.0621
Operating expenses (excluding taxes) per passenger	0.0245	0.0243
Net railroad operating revenue per passenger	0.0372	0.0378

London Street Railway

The gross earnings of the London (Ont.) Street Railway for the year ended Dec. 31, 1916, amounted to $426,314, an increase of $27,456, or 6.8 per cent, over those of the preceding year. Of this total, passenger traffic accounted for $420,704, an increase of $27,405, or 6.9 per cent. The total operating expenses amounted to $292,400, an increase of $17,188, or 6.2 per cent, this arising mostly from increases of $21,085, or 72.5 per cent, for maintenance of equipment, $7,344, or 5.5 per cent, for transportation expenses for car service, and $8,996, or 22 per cent, for general expenses. The net earnings for the year at $133,913 increased $10,267, or 8.3 per cent, but owing mostly to the increase of $8,123 in taxes, the net income at $93,610 showed a gain of only $2,757, or 3 per cent.

During the year $55,831 was expended for construction and equipment, $54,965 being for track and roadway construction. The passengers carried in 1916 totaled 11,518,428, as compared to 10,801,531 in 1915, and the car earnings per revenue passenger fell from 3.68 cents in 1915 to 3.67 cents in 1916. Transfers increased from 1,765,067 to 1,792,579, so that the car earnings per passenger dropped from 3.13 cents to 3.08 cents. The gross earnings per car mile were 21.99 cents in 1916 and 20.48 cents in 1915, while the net earnings per car mile were 6.91 cents and 6.35 cents respectively. The gross earnings per mile of track showed an increase from $11,334 in 1915 to $11,835 in 1916.

Although approximately 3000 citizens went with the overseas forces, the business of the company continued to increase substantially. Several battalions of soldiers were brought to London for training, so that approximately 12,000 men were in camp during May and June. This made extra car service necessary, and caused abnormal earnings for those two months. After that a large percentage of the troops was moved away for more extensive field training.

Liverpool Corporation Tramways

The total revenue of the Liverpool (England) Corporation Tramways for the calendar year 1916 amounted to £766,577. The operating costs, including the rental of leased lines, totaled £518,037, leaving a gross profit of £248,540. The net profit for the year, after the payment of interest, sinking fund charges and reserve payments, amounted to £145,971, an increase of £22,777 as compared with 1915.

The number of passengers carried in 1916 was 157,636,595, an increase of 6,880,915 over 1915, while the passenger receipts at £738,321 showed a gain of £41,428. The car-miles run in 1916 amounted to 12,688,163, an increase of 6145. The average earnings per car-mile for 1916 amounted to 13.97*d*. as compared to 13.20*d*. for 1915, an increase of 0.77*d*. The average fare per passenger in 1916 was 1.124*d*. as compared to 1.109*d*. in the preceding year. Up to Dec. 31, 1916, a total of 9,766,916 free transfers had been issued to members of the British forces, these being equivalent to £45,131.

Thirteen and a half million more passengers were carried in 1916 than in 1913, which had been the record year of the system. This large increase was no doubt brought about by the enormous number of persons employed in the manufacture of munitions and on admiralty and transport work in the port.

Chicago Railways

The comparative income statement of the Chicago (Ill.) Railways for the years ended Jan. 31, 1916 and 1917, follows:

	1917	1916
Gross earnings of Chicago Surface Lines	$34,789,636	$31,690,761
Operating expenses	21,743,522	21,041,356
Residue receipts	$13,026,114	$10,649,405
Chicago Railways' proportion of residue receipts (60 per cent)	$7,827,668	$6,283,149
Expenses and adjustments applicable to previous years	290,684	20,327
	$7,536,983	$6,262,822
Less 5 per cent on capital valuation	4,319,783	4,230,975
Divisible income	$3,217,200	$2,031,847
City of Chicago, 55 per cent	1,769,460	1,117,516
Chicago Railways, 45 per cent	$1,447,740	$914,331
Interest allowance on valuation	4,319,783	4,230,975
Interest on bank balances	66,960	64,807
Income from treasury securities	123,886	103,440
Gross income	$5,958,369	$5,313,553
Deductions	5,180,354	4,982,981
Net income	$778,015	$330,573

The full details of the earnings and expenses of the Chicago Surface Lines were published in the ELECTRIC RAILWAY JOURNAL of April 21, in connection with the annual report of the Chicago City Railway, which with other South-Side Lines receives 40 per cent of the residue receipts. As noted at that time, the gross earnings of all the surface lines increased $3,098,874 or 9.78 per cent during the last fiscal year.

The part of this gain coming to the Chicago Railways through its 60 per cent share in the residue receipts was $1,544,519, an increase of 24.5 per cent. The company's own gross income, after the city had deducted its 55 per cent share of the divisible total, represented a gain of $533,409 over the amount of $914,331 the year before, or not far from 60 per cent.

The net income of the company for the year was $778,015, as compared with $330,572 for the preceding year. The net income combined with the surplus at the beginning of the year amounted to $1,064,967. Deducting from this latter amount the total of the two dividends (participation certificates—Series 1, $8; Series 2, $2), together with the adjustment income bond interest for the preceding year (paid out of surplus May 1, 1916), aggregating in all $611,200, the surplus balance at Jan. 31, 1917, was $453,767. From this surplus there will be payable on May 1, 1917, the annual interest on the adjustment income bonds, amounting to $100,000.

During the year approximately $1,800,000 was expended for new construction and extensions under ordinance requirements. The company constructed a total of 11.08 miles of single track, making the total 580.65 miles. The unexpended balance in the special renewal and depreciation reserve fund on Jan. 31, 1917, was $3,663,514.

Dominion Power & Transmission Company, Ltd.

The comparative income statement of the Dominion Power & Transmission Company, Ltd., Hamilton, Ont., for the years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	$2,693,211	100.0	$2,353,956	100.0
Operating expenses	1,459,601	54.2	1,352,001	57.4
Net earnings	$1,233,610	45.8	$1,001,955	42.6
Transfer to maintenance and renewal account	157,689	5.9	109,640	4.6
Balance	$1,075,921	39.9	$892,315	38.0
Bond and other interest	365,573	13.5	384,772	16.4
Surplus earnings	$710,348	26.4	$507,543	21.6

The indications of the closing months of 1915, that the business of the company was rapidly tending toward recovery from the low figures of the 1914 report, were realized during 1916. The gross business for the last year was about equal to that of 1913, the best year preceding the war, and it is believed that there is hope for the coming year to show an improvement over 1913.

The gross earnings of the company gained $339,255, or 14.4 per cent, during the last year as compared to 1915, while the operating expenses increased only $107,600, or 7.9 per cent, so that the net earnings showed a gain of $231,665, or 23.1 per cent. The bond and other interest decreased $19,199, or 4.9 per cent, with the result that the surplus earnings for the last year represented a gain of $202,805, or about 40 per cent, as compared with those of the year preceding. After appropriating $250,000 to the regular reserve, paying dividends of $534,351 and making other adjustments, the profit and loss account on Dec. 31, 1916, totaled $536,060, as compared to $639,259 the year before.

The unexpended balance of the company's allowance of 20 per cent of the gross earnings for maintenance and renewals totaled $157,689 in 1916, as compared to $109,640 in 1915. This balance was credited to the reserve for maintenance and renewals. The withdrawals from the account in 1916 amounted to $46,610, and the reserve on Dec. 31, 1916, amounted to $403,050, an increase of $111,079 over the reserve the year before.

Staten Island Merger Disapproved

The Public Service Commission for the First District of New York has disapproved a proposed merger of the Richmond Light & Railroad Company and the Staten Island Midland Railway and the issue of certain securities incident to the proposed merger, as noted in the ELECTRIC RAILWAY JOURNAL of May 12, page 891. The commission acted upon an opinion prepared by Commissioner Charles S. Hervey. The opinion held that the merger plan included certain features inimical to the public interest and contrary to law and sound finance. The two companies own and operate all of the street railways on Staten Island, and in addition the Richmond Light & Railroad Company has a monopoly of the supply of electricity in Richmond Borough. It was proposed to consolidate the two companies and to issue $1,350,000 par value of 6 per cent cumulative preferred stock and $3,291,000 par value of common stock. In addition there was to be executed a mortgage and deed of trust to secure $7,500,000 par value of first and refunding mortgage 6 per cent gold bonds to be issued by the new corporation. Antecedent to the consolidation it was contemplated that the Staten Island Midland Railway should increase its authorized capital stock from $1,000,000 to $3,250,000. Commissioner Hervey criticized the plan for the merger on several grounds, one being to the effect that the company had submitted no proof that the bonds to be refunded had been issued for capital purposes. He also found cause to criticize a proposal to refund $350,000 in unpaid interest coupons of the Staten Island Midland Company by the issue of preferred stock. The commissioner held as a result of his study of the case that one claim of the applicants, namely, that the new securities would represent a decrease of $530,750 in capitalization, was erroneous. In substance, Commissioner Hervey held that various features of the plan were such as to place the commission in a position of acting illegally were it to grant approval of the proposed securities issues.

American Power & Light Company, New York, N. Y.—The combined gross earnings of the American Power & Light Company subsidiaries for the calendar year 1916 totaled $8,501,614, as compared to $7,817,802 the year before, while the net earnings in the two years were $3,941,669 and $3,566,334 respectively. Of the 1916 gross $182,383 or 2 per cent came from railway lines, this being divided $141,984 to the Pacific Power & Light Company, or 9 per cent of this subsidiary's earnings, and $40,399 to the Southwestern Power & Light Company, or 1 per cent of this company's earnings.

Billings Railway, Light & Power Company, Billings, Mont. The Billings Railway, Light & Power Company has been incorporated to take over the property of the Billings Traction Company and electrify the line. The authorized capital stock of the new company is $300,000.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—Under the order of sale recently issued by Judge Kinkead of the Common Pleas Court at Columbus, Ohio, E. K. Stewart of the Columbus Railway, Power & Light Company, William F. Burdell and Fred W. Herbst were appointed appraisers of the property of the Columbus, Delaware & Marion Railway. On May 8 they made their report which fixed the total value at $2,000,000 and set out that there are outstanding mortgage liens for $1,582,505 and damage claims estimated at $50,000, leaving a balance of $367,494. Other obligations outstanding amount to $920,000. On the following day the court approved the appraisement and fixed the upset price of the property at public sale at $250,000, subject to the liens. Eli M. West was appointed special master to sell the property on June 11. He has been receiver of the company for several years.

Hagerstown & Frederick Railway, Frederick, Md.—The stockholders of the Hagerstown & Frederick Railway have approved the plan for the readjustment of the finances of the company referred to in the ELECTRIC RAILWAY JOURNAL for May 12, page 891. Under the new plan the yearly interest charges and the preferred stock requirement will be reduced about $20,000 a year. A portion of the old preferred stock will be converted into new common stock and the holdings of the old common stockholders will be reduced by two-thirds. The plan is to date back to May 1. It has also been decided to dissolve the voting trust after the new plan becomes effective. The plan, however, must first be passed upon by the Maryland Public Service Commission. It is said unofficially that "it is expected that on the basis of the earnings for the year ended Dec. 31, 1916, the company will pay quarterly dividends on its new preferred stock beginning Aug. 1."

Havana Electric Railway, Light & Power Company, Havana, Cuba.—A special meeting of the stockholders of the Havana Electric Railway, Light & Power Company was adjourned on May 17 until May 22. Retiring directors were re-elected at the annual meeting of the company. It was proposed at the special meeting to vote on the matter of increasing the capital stock of the company in accordance with the conditions reviewed briefly in the ELECTRIC RAILWAY JOURNAL of April 28, page 799.

Illinois Traction Company, Peoria, Ill.—The Illinois Public Utility Commission has authorized the Urbana & Champaign Railway, Gas & Electric Company to issue 5 per cent debenture bonds to the extent of $114,000. The commission has also authorized the Galesburg Railway, Lighting & Power Company to issue 6 per cent cumulative preferred stock to the amount of $141,000. Both companies are controlled by the Illinois Traction Company. A committee of citizens of Lincoln, Ill., is understood to have conferred recently with H. E. Chubbuck, vice-president executive of the Illinois Traction Company, with respect to the taking over by that company of the street railway service in Lincoln operated previously by the Lincoln Railway & Heating Company. Last summer the Illinois Public Utilities Commission authorized the Lincoln Railway & Heating Company to discontinue business provided the Council of Lincoln would concur in the suspension of street railway service. The city desires to have the service continued. The property at Lincoln is a very small one and the basis on which the officers of the Illinois Traction Company were approached has not been disclosed.

J. G. White Companies, New York, N. Y.—The report of The J. G. White Companies for the year ended Dec. 31, 1916, presents an amalgamated balance sheet showing the following items: Assets—good will, contracts, etc., $1,512,351; securities owned and syndicate participations, $2,341,542; miscellaneous assets, $95,107; bills receivable, less reserve for doubtful items, $395,350; accounts receivable, less reserve for doubtful accounts, $577,942; interest and dividends accrued, $17,239; cash in bank and on hand, $500,941, and working capital and cash in branch offices, $4,004. Liabilities and capital—capital stock issued, $4,300,000; bills payable, $325,000; accounts payable, $158,977; dividends payable, $44,000; accruals less deferred charges and sundries, $24,231, and surplus or undivided profits, $592,270. During 1916 a large block of securities was liquidated at a satisfactory profit over the balance sheet figures. Since Dec. 31, 1916, the engineering corporation has secured several important and satisfactory engineering and construction contracts on a percentage basis and a large amount of profitable business in its purchasing and commercial departments. The management corporation has also secured some important management contracts in new lines of endeavor, including the management of sugar estates and industrial concerns.

Lake Shore Electric Railway, Cleveland, Ohio.—At the annual meeting of the Lake Shore Electric Railway on May 14 F. H. Goff, president of the Cleveland Trust Company; I. F. Frieberger, vice-president of the Cleveland Trust Company; J. R. Nutt, vice-president of the Citizens' Savings & Trust Company, and Charles Currie, vice-president of the Northern Ohio Traction & Light Company, were elected directors to succeed the late Henry A. Everett, J. B. Hanna, T. H. Hogsett and John P. Witt. The bank officials represent the estate of Mr. Everett. The officers of the company are: E. W. Moore, president; F. H. Goff, vice-president; A. Lewenthal, vice-president; F. W. Coen, vice-president and general manager; John P. Witt, secretary and treasurer.

Lehigh Valley Transit Company, Allentown, Pa.—At the close of business on May 9 there had been deposited $3,385,250 shares of preferred and $2,288,000 shares of common stock receipts of the Girard Trust Company, issued against deposits of Lehigh Valley Transit Company stock under the proposal of merger with the Lehigh Navigation Electric Company. This indicates that deposits in assent to the merger plan amount to 67.9 per cent of the preferred and 76.3 per cent of the common. It is stipulated that not less than 70 per cent of each class of stock be deposited. There is still needed $100,531 preferred stock to bring the total deposits up to the required figure.

Minster & Loramie Railway, Fort Loramie, Ohio.—The property of the Minster & Loramie Railway, operated by the Western Ohio Railway, has been sold for $23,000 at receiver's sale to C. P. Gress, representing the New Bremen First National Bank acting for creditors of the company. The road is 3.3 miles long. Energy for operation is furnished by the Western Ohio Railway.

Monongahela Valley Traction Company, Fairmont, W. Va.—The outstanding first mortgage bonds of the Fairmont & Mannington Railroad, which is controlled by the Monongahela Valley Traction Company, dated Jan. 1, 1916, have been called for payment on July 1 at 105 and interest at the office of the Guarantee Title & Trust Company, Pittsburgh.

Municipal Service Corporation, Philadelphia, Pa.—Announcement is made of the conclusion of the negotiations for the sale of the property of the Youngstown & Suburban Railway to the Municipal Service Corporation through an exchange of stock dollar for dollar. The securities of the Youngstown & Suburban Railway said to be included are the entire $350,000 of common stock, $500,000 of 6 per cent cumulative preferred stock and $700,000 of first mortgage 5 per cent bonds.

Pittsburgh & Butler Railway, Pittsburgh, Pa.—The property of the Pittsburgh & Butler Railway was sold at public auction on May 9 at $670,500. The property was bought by interests who are said to control the Pittsburgh, Harmony, Butler & New Castle Railway.

Southern New York Power & Railway Corporation, Cooperstown, N. Y.—The Southern New York Power & Railway Corporation on May 8 filed a certificate at Albany increasing its authorized capital stock from $1,500,000 to $2,500,000.

United Railways Investment Company, San Francisco, Cal.—The trustee of the mortgage had on hand on May 5 $1,747,000 par value of the United Railways Investment Company collateral trust sinking fund twenty-year 5 per cent gold bonds in the sinking fund, as compared with $1,388,000 on May 3, 1916, indicating that during the year $359,000 par value of the bonds has been purchased. In the twelve months previous to May, 1916, $322,000 par value of the bonds were acquired and in the twelve months preceding May, 1915, $350,000. The sinking fund provisions require that each year there shall be purchased a par value of the bonds equal to 1 per cent of the original issue, and the interest on the bonds purchased. This would have required the purchase last year of less than $250,000 par value of the bonds, whereas $359,000 were actually acquired, owing to the basis on which the bonds could be purchased in the open market.

Winnipeg (Man.) Electric Railway.—The gross earnings from operation of the Winnipeg Electric Railway for the calendar year 1916 totaled $3,311,169, with operating expenses at $1,939,041, so that the net operating revenues amounted to $1,372,128. The gross income available for fixed charges totaled $1,398,138 and the net income $445,251. The last figure is equivalent to about 5 per cent on the capital stock. The net income in 1916 showed a decrease of $35,742 from the results for 1915. According to a statement of the directors, the disappointing 1916 result was caused by the substantial increases in the cost of all materials necessary for the railway, gas and lighting departments, as well as by the serious competition of jitneys in Winnipeg. It was said to be reasonable to assume that with a return to normal conditions the revenues from the various departments will show satisfactory increases.

Dividends Declared

Central Arkansas Railway & Light Company, Hot Springs, Ark., quarterly, 1¾ per cent, preferred.

Central Mississippi Valley Electric Properties, Keokuk, Iowa, quarterly, 1½ per cent, preferred.

Pensacola (Fla.) Electric Company, quarterly, 2½ per cent.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
BATON ROUGE (LA.) ELECTRIC RAILWAY						
1m., Mar.,	'17	$18,277	*$9,637	$8,640	$3,525	$5,115
1 " "	'16	16,199	*8,999	7,200	3,461	3,739
12 " "	'17	218,061	*102,432	115,629	42,212	73,417
12 " "	'16	197,636	*106,935	90,701	30,989	59,712
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.						
1m., Mar.,	'17	$33,753	*$20,905	$12,848	$6,552	$6,296
1 " "	'16	27,866	*19,940	7,926	6,451	1,475
12 " "	'17	407,386	*237,115	170,271	78,553	91,718
12 " "	'16	371,850	*215,629	156,221	78,780	77,441
COLUMBUS (GA.) ELECTRIC COMPANY						
1m., Mar.,	'17	$87,851	*$33,907	$53,944	$28,350	$25,594
1 " "	'16	66,735	*28,272	38,463	28,705	9,758
12 " "	'17	936,494	*362,619	573,875	342,788	231,087
12 " "	'16	752,394	*328,458	423,936	344,242	79,694
DALLAS (TEX.) ELECTRIC COMPANY						
1m., Mar.,	'17	$188,025	*$120,055	$67,970	$40,794	$27,176
1 " "	'16	159,828	*100,143	59,685	36,779	‡24,906
12 " "	'17	2,061,842	*1,251,280	810,562	463,546	‡359,160
12 " "	'16	1,851,642	*1,140,849	710,793	414,454	‡303,539
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						
1m., Mar.,	'17	$75,062	*$43,077	$32,985	$9,913	$23,072
1 " "	'16	62,339	*34,888	27,451	8,867	18,584
12 " "	'17	862,126	*462,488	399,638	110,502	289,136
12 " "	'16	761,575	*398,230	363,345	105,630	257,715
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.						
1m., Mar.,	'17	$157,469	*$112,719	$44,750	$36,417	$8,333
1 " "	'16	158,393	*106,471	51,922	36,178	15,744
12 " "	'17	1,953,072	*1,254,997	698,075	439,695	258,380
12 " "	'16	1,925,685	*1,220,785	704,900	434,868	270,032
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.						
1m., Mar.,	'17	$30,497	*$19,606	$10,891	$5,026	$5,865
1 " "	'16	27,190	*14,692	12,498	5,357	7,141
12 " "	'17	334,706	*194,572	140,134	62,948	77,186
12 " "	'16	292,373	*162,348	130,025	66,259	63,766
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.						
1m., Mar.,	'17	$199,545	*$114,173	$85,372	$29,182	$56,190
1 " "	'16	166,936	*101,660	65,276	28,725	36,551
12 " "	'17	2,000,099	*1,188,249	811,850	347,921	463,929
12 " "	'16	1,777,984	*1,086,617	691,367	335,631	355,736
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.						
1m., Mar.,	'17	$768,418	*$478,629	$289,789	$191,724	$98,065
1 " "	16	655,362	*440,468	214,894	184,372	30,522
12 " "	'17	8,461,666	*5,206,585	3,255,081	2,234,954	1,020,127
12 " "	'16	7,603,965	*4,850,755	2,753,210	2,189,950	563,260
SAVANNAH (GA.) ELECTRIC COMPANY						
1m., Mar.,	'17	$77,252	*$52,672	$24,580	$24,077	$503
1 " "	'16	65,269	*45,240	20,029	23,344	†3,315
12 " "	'17	855,893	*566,586	289,307	284,792	4,515
12 " "	'16	786,035	521,013	265,022	278,401	13,378
TAMPA (FLA.) ELECTRIC COMPANY						
1m., Mar.,	'17	$89,765	*$46,954	$42,811	$4,373	$38,438
1 " "	'16	81,928	*45,224	36,704	4,395	32,309
12 " "	'17	980,349	*534,499	445,850	52,328	393,522
12 " "	'16	989,708	*513,922	475,786	52,202	423,584

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*Includes taxes. ‡Includes non-operating income.

Traffic and Transportation

Pennsylvania Jitneys Lose in Court

Decision Received Upon Appeal to Superior Court States That Jitneys Operating Within City Limits Are Common Carriers

The Superior Court of Pennsylvania has handed down a decision in a case involving the Scranton Railway, following an appeal from an order of the Public Service Commission which, it is believed, will affect the future of jitney operations in that State. It affirmed the order of the commission, thereby putting the control of jitneys under the jurisdiction of that body by classing them as common carriers.

The public service commission act of July 26, 1913, states: "The term 'common carrier' as used in this act includes any and all common carriers whether corporations or persons engaged for profit in the conveyance of passengers or property or both between points within this Commonwealth by, through, over, above or under land or water or both." The question involved in this case as presented by the appellant was whether the Public Service Commission has jurisdiction over those operating jitney service entirely within the limits of one municipality, and whether such operation is "between points."

HOW THE COURT REASONED

The court, in its decision, held it must be admitted that a jitney bus as ordinarily operated is a common carrier, and said that the counsel for the appellant had advanced no argument to the contrary, but had regarded the words "between points within this Commonwealth," appearing in the section above quoted, to apply to operation confined to the limits of a city or town. It maintained that although the word "point" is often used as a synonym for a city or town, the meaning of the word also includes parts of the same town. It refused to interpret the act to mean that a public carrier operating wholly within the limits of any city, but covering routes between terminals which might be more than 20 miles apart, would not come within the provision of the act. The decision stated further that the legislative intention was not to make an exempted class of public carriers operating wholly within the limits of a city and including those who ran beyond, and that the words "within this Commonwealth," as applied to this question, was evidently used to designate intrastate commerce as distinguished from inter-state traffic.

CORPORATIONS UNDER DUAL CONTROL

By an act of June 1, 1915, the power to regulate and license certain motor vehicles was given to the cities and it was contended that this is an implied repeal of the public service act of 1913, so far as it relates to the same subject. There is no express repeal in the later act, and if one is implied it would mean that both acts could not stand. Many public service corporations which fall under the provisions of the public service act are subject to local regulation, such as street car lines, which may not be constructed until municipal consent is obtained, and railroads, which are subject to ordinances requiring them to place watchmen at crossings and subjecting them to other regulations.

In view of the above the court concluded that the authority given by the act of 1915 could not be held in any view of the matter to give cities any power that would abrogate the right of the Public Service Commission to require a certificate of public convenience. The two powers do not intrench on each other since the Public Service Commission and City Councils can exercise their powers coordinately. This decision will no doubt form a better basis for jitney regulation in Pennsylvania. Heretofore the city drivers have declined to operate with a certificate of public convenience since they contended they were subject only to the municipal authorities.

Jitney Insurance Question in Washington

H. O. Fishback, State Insurance Commissioner of Washington, has submitted to the Attorney General a proposal of the Mutual Union Insurance Company of Seattle, composed of jitney operators, to furnish surety insurance for jitney operators. The point raised is whether a mutual company can insure the traveling public or only its own members. Commissioner Fishback has decided to permit the new mutual company, composed entirely of jitney operators, with W. R. Crawford, Seattle, as general counsel, to insure its members for $1,000 against accident to themselves, and upon the collection of a cash reserve of $5,000 additional to $6,452 now paid in, to write liability insurance for machines of members up to $2,500, upon additional premiums of $200 annually, $30 of which is paid in cash and balance at $10 a week.

As the State Supreme Court has held jitney bondsmen liable up to $2,500 for each person injured in a wreck, the jitney operator mutual insurance does not yet meet the requirements of the Supreme Court, it is claimed, but it is believed an effort will be made to accumulate sufficient reserve for that purpose, if it is held that a mutual company may write surety insurance.

A list of 321 members applying for the machine liability insurance has been filed with the insurance commissioner, with another list of 500 subscribing for accident insurance.

The jitney men of Spokane, applying for a temporary injunction preventing the city from requiring them to give bond in order to operate, quoted A. M. Winston, assistant corporation counsel of the city, to the effect that jitney operators could get bonds without trouble if they had adequate collateral.

Los Angeles Anti-Jitney Men Multiply

The committee representing the 3500 employees of the Los Angeles (Cal.) Railway has filed with the City Clerk the initiative petition signed by more than 35,000 registered voters, which asks for the adoption of an initiative ordinance intended to insure a more effective control of the operation of jitneys as reported in this paper for May 5, page 846. The proposed ordinance will be submitted to the people at the coming election on June 5.

W. A. Hagans, organizer of the Jitney-bus Operators' Association, said: "This is a most drastic measure and if put into effect will stop jitneys from operating in the downtown business district after July 1."

The employees of the Pacific Electric Railway have joined forces with the men of the Los Angeles Railway in the movement for better jitney regulation and have circulated petitions in a similar way. They are pleased with the responses received and claim that when the necessary eliminations are made because of faulty signatures, they will be able to file nearly 75,000 valid signatures in addition to the 35,000 which the Los Angeles Railway employees have obtained.

Service Reductions in Tacoma

The Tacoma Railway & Power Company and the Pacific Traction Company, Tacoma, Wash., will reduce service on car lines which have been operated at a loss. L. H. Bean, manager of the companies, is quoted in part as follows:

"The companies have endeavored to maintain a service for the public in all ways satisfactory for their needs, and in order to do this we have been forced to operate at a loss. We have repeatedly called attention to the serious financial situation which confronts the companies. We hoped to be relieved of burdens such as paving and the tax on gross earnings which are not in any way necessary for furnishing service. This relief having been temporarily deferred, we are forced to reduce service on lines where service has been maintained entirely for the benefit of the public but at a serious financial loss to us."

Mr. Bean also states that after thirty days city commutation tickets will be withdrawn. These tickets are used by city employees during working hours. They aggregate about $6,000 a month.

Auto Drivers Urged to Use More Care

An open letter was recently sent out by General Manager A. R. Myers of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., with a view to secure the co-operation of automobile drivers in reducing the number of automobile accidents. It was a personal appeal to all concerned to take an added interest in the elimination of unnecessary pain, injuries and expense. The letter read, in part, as follows:

"We do our part by educating our motormen and conductors to avoid collisions with automobiles and other vehicles. You can do your part without any expense to you, and we ask you to do it. Do you forget to check the speed of your car when with obstructed view either way you approach an intersecting street on which cars operate? If so, your habit should be changed. Some automobile drivers turn to the left onto a track in front of cars going in the same direction in order to pass a more slowly moving vehicle or one standing at the curb. It is easy to misjudge the speed of a trolley car and to mistake the amount of space in passing between the car and other vehicles. Did you ever do this? If so, for your family, yourself and for your friends, stop it.

"Our experience and investigations compel us to speak candidly. We are making this a personal matter. If you are a careful driver you will not resent this letter. If you are inclined to be careless you cannot in fairness resent it. 'Safety First' is a great big humanitarian movement. If we all pull together we can succeed. Will you help?"

Bay State Fare Bill Turned Down

The lower house of the Massachusetts Legislature has voted down the report of the joint committee on rules, accepted by the Senate, favoring the admission of a 6-cent fare bill for the Bay State Street Railway. Owing to the lateness of the session, it was necessary to secure a suspension of the rules to permit consideration of the bill. Now it is said, the bill must go to the next Legislature.

The bill providing for an increase in fare stipulated that the 6-cent rate should apply to a single continuous trip in any fare zone as already laid out or which might hereafter be established by the Public Service Commission. The bill provided that the company should pay no dividends on its common stock for two years, and that its net earnings above preferred-stock dividends should be expended for improving the property.

The company has also had a clause introduced which provided for an investigation of the problem of public ownership by a commission to consist of two Senators, four Representatives, one member of the Public Service Commission and four citizens, the last five to be named by the Governor. The lower house of the Legislature also refused to admit this provision for consideration.

The filing of the relief bill followed about nine months' experience under the ruling of the commission in the noted 6-cent rate case of 1916, in which the board denied the company permission to raise its fare to 6 cents throughout the greater part of the system, but authorized this unit on the country lines.

S. H. Pillsbury, counsel for the company, stated at a legislative hearing that the credit of the road was exhausted; that no new money could be raised, and that earnings had shrunk more than $1,000,000 in the last three years. Mr. Pillsbury said that in the past three months the company had run $145,522 short of its expenses, without making any allowance for depreciation. He contended that the present cost of carrying a passenger was 6.10 cents, compared with 5.27 cents in 1916, 5.14 cents in 1915, and 4.94 cents in 1914. The company was willing to sell its property at about $39,000,000, the value fixed by the commission in the rate case.

Fare Protest Under Consideration.—The Borough Council of Rutherford, N. J., has under consideration the matter of seeking a reduction in the present 15-cent fare to Newark over the Public Service Railway.

Half-Fare Hearing Postponed.—The Public Service Commission of Massachusetts has postponed to June 5 its hearing upon the scholar's half-fare petition of the Bay State

Street Railway, on account of pending legislation in connection with the company's 6-cent fare bill and the proposed investigation of public ownership of street railways.

Increase in Monthly Commutation Authorized.—The State Railroad Commission of California has authorized the San Francisco Napa & Calistoga Railway, Napa, Cal., to make a commutation fare of $6 for the calendar month between Napa and Vallejo. The company asked the commission to increase the present commutation from $5 to $7.80, alleging the existing fare to be non-remunerative in consideration of the character of service rendered.

United Railroads Haul Fewer Passengers.—During March the United Railroads, San Francisco, Cal., carried 17,900,000 passengers, only about 85 per cent of the number carried in the same month of 1914. These figures were given out as evidence that street railways have not shared the general prosperity since the war began. Among the reasons advanced for this decrease is competition from the jitneys and the Municipal Railway of that city.

Macon Men Insured.—Approximately 150 motormen and conductors in the service of the company have been insured by the Macon Railway & Light Company, Macon, Ga., for sums ranging from $200 to $500, each premium being paid by the company. Each employee must have six months' service to his credit in order to be insured. Each man having two years' service is insured for $200; three years' service, $300, with $500 as the maximum.

Kentucky Derby Affords Traffic Problems.—The attendance on May 12 at the forty-third renewal of Derby Day, the annual racing tournament in Louisville, Ky., was one of the highest on record and taxed the capacity of the Louisville Railway. It is estimated that the company hauled about 34,000 people from the downtown district to Churchill Downs, the scene of the races. This is more than the number of passengers hauled last year. All the available equipment of the company was put in service and no accident was reported. An improvement was made in the service this year by changes in routing in Louisville.

Protest Proceedings Authorizing Seattle One-Man Cars.—At a recent meeting of the city utilities committee, Councilman W. D. Lane, chairman of the judiciary committee, filed a protest against the action of the State Public Service Commission in issuing an order allowing the use of single-truck and single-operator cars by the Puget Sound Traction, Light & Power Company in Seattle, Wash., without advising the city of such an application. A copy of the order was referred to Councilman Lane by Corporation Counsel Hugh M. Caldwell, for preparation of such a protest. The use of one-man cars was referred to the Council by the officials of the company several months ago, but no action was taken. Several weeks later, an application for an order allowing the use of this type of car was made to the Public Service Commission. It is understood that Mr. Lane's protest will be limited to an arraignment of the Public Service Commission for the alleged granting of a petition without notifying the Council and holding hearing in regular form.

Taking Chances.—Not long ago Gerald Stanley Lee of Northampton, Mass., who gained fame with his book "Crowds," wrote an appreciation of all the wonderful things that the patron of an electric railway car got for his nickel. That appreciation was republished in the ELECTRIC RAILWAY JOURNAL and then was copied and used by many publications distributed to railway employees. An opportunity exists now for some one to put into language that will live the prospect that the jitney patron has in store for him for his nickel. There are the reckless driving, the crowding, the collisions, the thefts that take place in poorly lighted cars and finally the prospect that your driver may do as did Charles Yasmagian, a licensed jitney driver of Lowell, Mass., that is, peer into the gasoline tank with a lighted match to see how low his supply of gas was. If he should do that there are added to the ordinary thrills of the jitney ride the clanging of the fire bells, the coming of the engines, the approach of the ambulances, prospects of a cot in the hospital and finally burial in the country churchyard. All the melodrama of the movies for 5 cents! After life's fitful fever you will probably sleep well, but by taking a jitney you increase materially the likelihood of your sleeping before your allotted time.

Legal Notes

CHARTERS, ORDINANCES, FRANCHISES

KENTUCKY.—*Improvement of Street by City—Franchise—"In All Respects."*

Where a street railway company franchise required it to improve its portion of the street to conform with the rest of the street "in all respects," and upon the company's refusal the city constructed the company's portion, different only in the depth of excavation necessary to accommodate ties and foundation, this was not contrary to the franchise, and the company was liable for the cost. (Central Kentucky Traction Co. v. City of Winchester, 191 Southwestern Rep., 636.)

TEXAS.—*Legal Difference Between "Express" and "Freight."*

The question whether goods carried by an interurban electric railroad are express or freight, on which depends whether the railroad is an additional servitude on the street, does not depend on the weight of the separate articles but on the manner in which they are carried, since the carriage of a few heavy articles would not damage the abutting owners more than the carriage of a large number of lighter articles in the same car. (Galveston-Houston Electric Ry. et al. v. Jewish Literary Society, 192 Southwestern Rep., 324.)

WISCONSIN.—*Repaving Ordinance Is Valid Even If It Reduces Earnings.*

The fact that an ordinance, requiring a street railway to repave its track zone with the same material used by the city, will unreasonably reduce its earning capacity, so as to fail to give reasonable return on the investment, will not invalidate the ordinance, since the company can apply to the Railroad Commission for a change in rates if necessary.

The Milwaukee ordinance of Nov. 8, 1915, requiring a street railway to repave its track zone with the same material used by the city, is not unconstitutional as impairing a contract obligation, since previous ordinances relating thereto did not give the railroad company a contractual right, but were merely regulative, nor does it deprive the company of its property without due process of law. (State ex rel. City of Milwaukee v. Milwaukee Electric Railway & Light Co., 161 Northwestern Rep., 745.)

LIABILITY FOR NEGLIGENCE

NEW YORK.—*Ice on Car Platform.*

Where a carrier did nothing to remove ice from the platform of a car operated in a large city, with frequent stops at short intervals, with large numbers of persons passing in and out, and gave the passengers no notice of the presence of the ice, an inference of negligence is warranted. (Altberger v. New York Consolidated Railroad, 162 New York Sup., 739.)

NEW YORK.—*Injury Where Passenger Assumes Car Will Stop at Station.*

Where the local cars of a railroad company stopped on signal at a station established to receive passengers, and no particular form of signal was established, a prospective passenger clearly visible, with a suitcase in her hand, hurrying to the pole which marked the stopping place, is entitled to assume that the car will be stopped. (Brott v. Auburn & Syracuse Electric Railroad, 115 Northeastern Rep., 273.)

NEW YORK.—*Workmen's Compensation Act—"Hazardous Business."*

A street surface railroad is engaged in a "hazardous business," under the workmen's compensation law (Consol. Laws, chap. 67; Laws 1914, chap. 41). A street railway conductor, temporarily relieved of duty, who was riding back on a car to his work, who left the car and in crossing the street was killed by his employer's street car, was not at the time, within workmen's compensation act, Sec. 3, Subd. 4, engaged in a hazardous employment. (McCabe v. Brooklyn Heights Railroad, 162 New York Sup., 741.)

Personal Mention

William Mittendorf, assistant chief engineer of the Cincinnati (Ohio) Traction Company, has been appointed chief engineer, succeeding Thomas Elliott. Mr. Mittendorf has been acting chief engineer for three years during Mr. Elliott's connection with the Cincinnati Car Company.

W. S. Murray, the engineering firm of McHenry & Murray, New Haven, Conn., having been dissolved by mutual consent, will hereafter devote his entire time and attention to the interests of the Housatonic Power Company, of which he is president. Mr. McHenry will retire to private life.

Thomas Elliott, chief engineer of the Cincinnati (Ohio) Traction Company, becomes consulting engineer of the company. Mr. Elliott has been vice-president and general manager of the Cincinnati Car Company for about three years, but retained his title of chief engineer of the traction company.

Niles Persons, for the last four years assistant master mechanic of the United Traction Company, Albany, N. Y., who resigned to accept a position with the New York State Railways, Rochester Lines, was presented on May 5 with a gold watch and chain, and an Elk's charm with a genuine elk tooth by the employees of the mechanical department of the company at Albany.

S. R. Bertron, banker and financier, has been appointed a member of the commission to Russia by President Wilson. Mr. Bertron is connected with the firm of Bertron, Griscom & Company, New York, N. Y., which is largely interested in the United Gas & Electric Corporation, the New Orleans Railway & Light Company, the International Railway and other public utility properties.

G. N. Brown and **H. S. Johnson**, superintendent of transportation of interurban lines and engineer of maintenance of way, respectively, of the New York State Railways, Utica Lines, departed on May 14 to attend the Officers' Reserve Corps Training Camp for three months at Sacket Harbor, N. Y. Mr. Brown is also electrical engineer of the Syracuse and Utica lines of the company.

Arthur V. Gardiner has been appointed superintendent of track for the Rhode Island Company, Providence, R. I., succeeding H. F. Purrington, who accepted a position with the Connecticut Company. Mr. Gardiner was engaged in trolley line construction for three years prior to 1908 when he entered the construction department of the New York, New Haven & Hartford Railroad. Since 1913 he has been a resident engineer of the Rhode Island Company.

Charles O. Warfel, superintendent of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., has received leave of absence to attend the officers' training camp at Fort Benjamin Harrison, and the following readjustment of duties has been made to cover this change: L. W. Henry, chief clerk for the president, will also be acting superintendent, with headquarters at Indianapolis. J. L. Jackson, formerly agent at Greensburg, Ind., will be made traveling freight agent and assistant to L. W. Henry. These changes are effective at once.

Perry R. McComas has been appointed superintendent of railways of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, with jurisdiction over all transportation employees. Mr. McComas is a native of Illinois. He spent the major part of his career in the steam railroad field, beginning as a telegraph operator for what is now the Chicago & Alton Railroad. Following a five-year connection as station agent for the Chicago, Peoria & St. Louis Railroad he was chief train dispatcher for the Illinois Terminal Railroad and later for the Litchfield & Madison Railway and then he served nearly seven years as train dispatcher and chief clerk to the general superintendent of the Toledo, Peoria & Western Railway. For the past six years Mr. McComas has been chief train dispatcher and car accountant of the Peoria (Ill.) Railway Terminal Company, a subsidiary of the Illinois Traction System. His headquarters are now at Genoa, Ohio.

Alvah Seaman has been made superintendent of the trolley lines of the Long Island Railroad, New York, N. Y., succeeding J. P. Kineon. Mr. Seaman was born in 1863 in Pike County, Pa., where he received his early education in the public schools. At the age of twelve he entered the telegraph office of the Pennsylvania Coal Company at Hawley, Pa., and five years later was employed by the Western Union at Scranton. His connection with the Long Island Railroad dates from 1882, when he was employed as telegraph operator at East New York, now a part of Brooklyn. Mr. Seaman's services have merited several promotions, first to train dispatcher at Woodhaven Junction, and then station master located at Long Island City. In 1906 he became assistant trainmaster in charge of time-tables. His headquarters are now at Far Rockaway, and the roads of which he is superintendent are the Ocean Electric Railway, the Huntington Railroad, the Nassau County Railway, the Glen Cove Railroad and the Northport Traction Company, all controlled by the Long Island Railroad.

C. W. STOCKS

Carl W. Stocks, who for the last seven years has been statistician of the American Electric Railway Association, has been appointed general passenger agent of the Bay State Street Railway, with headquarters at Boston. In his new position Mr. Stocks will work in co-operation with R. M. Sparks, formerly general passenger and advertising agent and now assistant to the general manager. This position will give him an excellent opportunity to apply the experience which he has gained in his statistical investigations for the association members. In returning to the railway field in Massachusetts he will not be upon ground entirely unfamiliar as he was for two years, between 1907 and 1909, an inspector in the overhead line department of the Boston & Northern Street Railway, a company which now forms part of the Bay State system. Mr. Stocks was graduated from the electrical engineering course at the Worcester (Mass.) Polytechnic Institute in 1907. As a senior he had a year's contact with Prof. A. S. Richey, who in 1906 resigned his position as chief engineer of the Indiana Union Traction Company to become a member of the faculty of the Institute. After graduation Mr. Stocks was employed by the Boston & Northern as already mentioned, and in 1909 became assistant to the master mechanic in the Everett Mills at Lawrence, Mass. The textile industry, however, did not appeal to him. He, therefore, welcomed the opportunity in 1910 to become assistant to H. C. Donecker, secretary of the American Electric Railway Association, and has been continuously with the association since that year. As he became familiar with the opportunities afforded by the association work Mr. Stocks took on one responsibility after another until he was editing and publishing the *Proceedings*, writing and revising the *Engineering Manual*, acting as head of the Information Bureau, and in other ways proving useful to the industry.

On April 14 the Toledo *Times* praised Henry L. Doherty, chairman of the board of the Toledo Railways & Light Company, Toledo, Ohio, for the energy that he has shown in connection with the effort to settle the franchise situation there. The paper said: "It is worthy of observation that while the 'street car commission' has been extracting from Mr. Doherty information on how to run a street railway system, he has been going ahead constructively. The new power plant on the East Side is going to be a model of its kind. It is characteristic of Mr. Doherty that whatever he undertakes he does well. The addition to the city's lighting and traction facilities will be increased many fold, meeting the requirements of the present and the needs of the future. His energies here merely parallel his energies in the other cities in which he operates. He fits in with the community and aims to be a vital part of it."

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Marion (N. Y.) Railway Corporation.**—Incorporated to maintain and operate electric railways. Capital stock, $100,000. Incorporators: Claude N. Jagger and Charles L. Seybold, Marion, and James D. Bashford, Lyons.

FRANCHISES

Terre Haute, Ind.—The Terre Haute, Indianapolis & Eastern Traction Company has received a franchise from the Board of County Commissioners of Sullivan County to extend its power lines to the mines of the Vandalia Coal Company.

New York, N. Y.—The New York & Long Island Traction Company has asked the Public Service Commission for the First District of New York for permission to discontinue the operation of its line in Rockaway Road and Broadway, between Liberty Avenue and Grant Avenue, Queens, and also to abandon the franchise it holds for routes not yet constructed between Queens and Jamaica and in Jamaica. In its application to the commission for permission to abandon the above routes and franchises, the company states that operation over these thoroughfares is no longer necessary because of the construction of the Liberty Avenue extension of the Fulton Street elevated line.

TRACK AND ROADWAY

Little Rock Railway & Electric Company, Little Rock, Ark.—This company proposes to construct an extension of its line on Pike Avenue from Eighth Street to Eighteenth Street.

San Francisco, Napa & Calistoga Electric Railway, Napa, Cal.—Work will soon be begun by this company on improvements to its roadbed in Sonoma Street, Vallejo. New ties will be installed and new pavement laid between and on either side of the tracks.

Connecticut Company, New Haven, Conn.—The City Council of Rockville has ordered the Connecticut Company to relocate its tracks on Grove Street. It is estimated that the work will cost about $9,000.

Waterbury & Bristol Tramway, Waterbury, Conn.—A survey will be begun at once by William G. Smith, Waterbury, Conn., of this company's proposed line between Bristol and Waterbury. It is expected that construction work will be begun in August. The following officers have been elected: Frederick N. Manross, Bristol, president; Richard Elliott, Southington, treasurer, and John H. Cassidy, secretary of the Waterbury & Milldale Tramway, Waterbury, secretary. Directors: Frederick N. Manross, Richard Elliott, John H. Cassidy; John R. Hughes, Waterbury, and Irving I. Ingraham, Bristol. [Dec. 23, '16.]

Waterbury & Milldale Tramway, Waterbury, Conn.—An amendment has been made to the charter of the Waterbury & Milldale Tramway providing for an extension of the company's lines for about 3 miles in the southeastern section of Waterbury.

Chicago (Ill.) City Railway.—An agreement has been reached between this company and the Chicago, Rock Island & Pacific Railway whereby the Chicago City Railway may finish its crossing at 111th Street and provide service to and from Morgan Park and various cemeteries near Morgan Park.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—Actual construction work has been begun by this company on the building of the extensions of its lines in Waukegan, Ill. The work was begun at the intersection of Grand Avenue and the west line of the North Shore interurban line, where a track 500 ft. long will be located. The switch will be placed into immediate use and will be operated for the handling of the material for the work of extending the lines on North Avenue and Glen Flora Avenue. The initial switch will become a part of the line on Glen Flora Avenue which will connect the West Side line with the tannery. The plans of the company include an expenditure of $150,000 in Waukegan for permanent improvements and reconstruction.

La Salle County Electric Railroad, Ottawa, Ill.—Plans are being made to revive the project to construct a line from Ottawa to Mendota. The Potapsco Engineering Company is said to be willing to go ahead with the work as soon as the preliminary matters pertaining to the right-of-way are established and to carry out the work on the basis of accepting as its pay a considerable proportion of the securities of the railway. The line has been graded for 25 miles. W. C. Vittum, Ottawa, is interested. [July 22, '16.]

Illinois Traction System, Peoria, Ill.—The installation of an interlocking plant for the crossing of this company's line with that of the Lake Erie & Western Railroad at East Peoria has been recommended.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company has received permission from the Board of Public Works to construct an additional track in Martindale Avenue from the tracks of the Indianapolis Union Railway to Twenty-fifth Street to facilitate the handling of troops to Fort Benjamin Harrison.

Wichita-Walnut Valley Interurban Railway, Wichita, Kan.—Right-of-way is being secured by this company for its proposed line from Wichita through the oil fields to Augusta, Douglass and El Dorado. The capital of the company will be increased from $1,000,000 to $1,500,000. T. C. Coffman, secretary. [May 5, '17.]

Trenton, Lakewood & Seacoast Railway, Trenton, N. J.—The directors of the Trenton, Lakewood & Seacoast Railway have announced that work will be rushed on its line from Point Pleasant to Lakewood. Tracks have been laid as far as Laurelton. George O. Vanderbilt, Trenton, is interested. [Nov. 18, '16.]

International Railway, Buffalo, N. Y.—A bill has been passed by the State Senate granting a two-year extension of time to the Frontier Electric Railway, owned by the International Railway, in which to construct its proposed line between Niagara Falls and Buffalo.

Ohio Electric Railway, Cincinnati, Ohio.—The construction of an extension to Defiance and the erection of a passenger and freight station in that city are being considered by the Ohio Electric Railway.

Gallipolis & Northern Traction Company, Gallipolis, Ohio.—This company reports that it may construct about 1 mile of new track.

Youngstown & Suburban Railway, Youngstown, Ohio.—Plans are being made to double-track most of this company's line and to construct an extension from Columbiana to East Palestine, 8 miles.

***Muskogee, Okla.**—Announcement has been made by Mayor J. E. Wyand of Muskogee that an electric interurban railroad between Muskogee and Oklahoma City crossing another between Henryetta and Tulsa at Okmulgee is proposed by Oklahoma City capitalists who have practically consummated their plans.

Oregon Electric Railway, Portland, Ore.—A contract has been awarded by the Oregon Electric Railway to Grant, Smith & Company, Portland, for the erection of trestle approaches to the bridge to be built over the Willamette River at Wilsonville, Ore. The trestle will be 2600 ft. long and will cost about $60,000.

Easton (Pa.) Transit Company.—Work has been begun by the Easton Transit Company on the double-tracking of its line between Bethlehem and Easton.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, Pa., William S. Twining, director, until May 22, for contract No. 521, including concrete track floor, cast-iron and steel floor drains and reinforced concrete slab footwalks for the Frankford Elevated Railway from Callowhill to Indiana Streets, about 15,680 lineal feet of structure; contract No. 522, concrete track floor, cast-iron and steel floor drains and reinforced concrete slab footwalks for the Frankford Elevated Railway from Indiana to Dyre Streets, about 15,000 lineal feet.

***North Star Electric Railway, Belle Fourche, S. D.**—This company has been organized to construct an electric railway from Belle Fourche to Dickinson, via Scranton. C. A. Johnson, Scranton, N. D., is interested.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—The Chamber of Commerce of Chattanooga, Tenn., looking forward to the near future when 100,000 men will be in training at Fort Oglethorpe, near that city, has asked the Chattanooga Railway & Light Company to expedite construction of a short line planned from the city to Chickamauga Park. This short line is planned to supplement another which already reaches the park. It would give a second trolley connection and supplement the connection provided by the Georgia Central Railroad.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—Work has been begun by the Salt Lake & Utah Railroad on the construction of an extension from Hunter to Pleasant Green, about 9 miles. The cost is estimated at about $300,000.

Rutland Railway, Light & Power Company, Rutland, Vt.—Work has been begun by the Rutland Railway, Light & Power Company relaying the ties and graveling the tracks of its main line from Rutland to Poultney.

Aberdeen, Wash.—Representatives of Sanderson & Porter of New York, who have been assigned a part in the government shipbuilding work, have been investigating prospective yards in Grays Harbor, Wash., for the past few days. Five sites, two in Hoquiam and three in Aberdeen, have been under consideration. Sanderson & Porter own the Grays Harbor Railway, Light & Power Company, connecting Aberdeen with Cosmopolis and Hoquiam.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company will construct a line along Avalon Way from West Spokane Avenue and Thirtieth Avenue southwest to West Seattle.

Tacoma, Wash.—The city of Tacoma has received an urgent appeal from Ernest Dolge, Inc., to extend the tideflats line from its present proposed terminus at the Todd Shipbuilding & Construction Company's plant, to Lincoln Avenue, to give service to employees of a lumber mill which is being constructed by Ernest Dolge, Inc. The Council is favorably considering the further extension.

Tacoma Railway & Power Company, Tacoma, Wash.—Following the recent decision of the Public Service Commission of Washington that it has no jurisdiction to relieve public utilities of paving obligations and other franchise burdens, it is stated the Tacoma Railway & Power Company will repave between its tracks on Broadway, St. Helena Avenue and Sixth Avenue, at a cost of $100,000.

SHOPS AND BUILDINGS

Indianapolis & Louisville Traction Railway, Scottsburg, Ind.—This company reports that it has just completed a freight and passenger station at Henryville.

Boston (Mass.) Elevated Railway.—Recommending an underground terminal and a temporary surface station in Everett, the Public Service Commission of Massachusetts on May 14 withheld approval of this company's petition for the erection of a permanent station for the elevated extension upon private land abutting on Broadway and Everett Streets between Chemical Lane and Brickyard Lane. The commission figures that the temporary station would save about $372,000.

Worcester (Mass.) Consolidated Street Railway.—Preliminary designs have been begun by H. R. Whitney, engineer of way and structures, Worcester Consolidated Street Railway, for the construction of a new fireproof carhouse at the intersection of Grove Street and Park Avenue, Worcester. The first section to be built will have a storage capacity of about forty-eight cars and an outdoor storage capacity of 120 cars on yard trackage. The carhouse will probably be erected in 1918.

Detroit (Mich.) United Railway.—The third unit of the Highland Park shops of the Detroit United Railway has been completed and is now in use. This unit is the building which houses the carpenter shop, wood mill, cabinet shop, pipe-fitting department, pattern shop and tinsmithing department. The building is 287 ft. x 238 ft., two stories high, and is of brick and steel construction. It is adjacent to the machine and truck shops and is connected with them by a transfer table permitting the switching of cars from one building to another. The floors of the building are of concrete with a surface of creosote blocks and the roof is constructed of concrete slabs. The east and west walls are practically of glass with mechanically operated windows. The fourth unit to be erected will be a brass foundry. A modern and permanent power and heating plant will complete the layout. More than $1,000,000 will have been expended on the plant when all construction work is completed.

Interborough Rapid Transit Company, New York, N. Y.—Bids will be received by the Interborough Rapid Transit Company at the office of the chief engineer, 165 Broadway, New York City, until May 24, for completion of the passenger station electric lighting and electric heating systems for portions of the Seventh Avenue line, routes 4 and 38; Pelham Bay Park branch of the Lexington Avenue line, route 5, section 15, and routes 19 and 22, sections 1 and 1-A, Lexington Avenue line, route 5. Drawings, proposal blanks, etc., may be obtained at the above office. George H. Pegram, chief engineer.

POWER HOUSES AND SUBSTATIONS

Burlington Railway & Light Company, Burlington, Iowa.—The erection of several transmission lines this year, it is reported, is contemplated by the Burlington Railway & Light Company. One of the proposed lines will connect Burlington with Mediapolis, Morning Sun, Wapello and Winfield; another line will be erected from Burlington to Middletown. Energy will be supplied from the plant at the Keokuk dam to the cities and towns north of Burlington.

Gulfport & Mississippi Coast Traction Company, Gulfport, Miss.—A report from this company states that it will place contracts as soon as possible for equipment to convert boilers now using coal to wood burning. The company is also in the market for machinery to handle slabs and other saw mill refuse.

Kansas City (Mo.) Railways.—This company is considering the construction of a one-story substation, to cost about $7,000.

Butte (Mont.) Electric Railway Company.—This company plans the immediate construction of two substations in Butte, one at the southeast corner of Florence and Major streets; the other at 218 East Center Street. Permits have been issued to the company for putting up both buildings.

Northern Ohio Traction & Light Company, Akron, Ohio.—Fire recently destroyed the Wooster Avenue carhouse and three cars of the Northern Ohio Traction & Light Company. The loss is estimated at about $50,000.

Youngstown & Sharon Street Railway, Youngstown, Ohio.—This company will extend its transmission lines to East Palestine at once.

Reading Transit & Light Company, Reading, Pa.—This company has doubled the coal storage capacity at its West Reading power plant. With the added facilities, the plant will be able to store between 20,000 and 30,000 tons of coal. New fuel-handling machinery of the latest type has been installed. The company has also purchased two new 1000-hp. boilers.

North Star Electric Railway, Belle Fourche, S. D.—This company, which has been organized to construct an electric railway from Belle Fourche to Dickinson, via Scranton, plans to construct a power plant in connection with the project. C. A. Johnson, Scranton, N. D., is interested.

Appalachian Power Company, Bluefield, W. Va.—This company will construct an electric transmission system between Norton, Esserville, Wise and other towns in this section.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases   Market Quotations   Business Announcements

Present Business and Economic Conditions*

How War Will Affect Business—What the Manufacturers Should Do—Governmental Support to Assist Manufacturers

BY FRANK BAACKES
Vice-President and General Sales Manager American Steel & Wire Company, Chicago, Ill.

We are confronted at this time with a very intense political and economical condition, and the two are so intimately connected that they cannot any longer be treated separately as to their consequences. Our political condition has been somewhat clarified by our entrance into the war, but our economical condition has become more intensified than ever. Heretofore, we were confronted with one condition, namely, that we sold to the Allies what we felt we could spare. That, however, is absolutely changed to-day, because our entrance into this war makes us immediately an ally to the Allies.

WHERE THE MANUFACTURERS MUST STAND

Now, that is going to make the situation very acute. It is said that this will require only 5 per cent of the steel, 3 per cent of the leather goods, and 30 per cent of other goods. But when that 5 per cent is required during a time that the demand is 150 per cent and the capacity 100 per cent, then it is evident how far-reaching that condition must be to this nation. This situation is going to affect our domestic business, and the slogan of every manufacturer and of every merchant from now on must be the Allies and our own government first, domestic trade second, and export trade third. That will mean that we must be passive. Also, that this is a time to control our selfishness. And if we are all going to use common sense and distribute our products intelligently and conservatively from what is left, we probably all can have material with which to do business. We must be very conservative, and I cannot put that too strongly before you.

I do not believe that prices should be advanced now unless it is absolutely necessary. I do not believe in a policy of selling the government on one hand at a very low price, and then trying to tax the individual at an advanced price, thereby making the other fellow pay for your patriotism. We have permitted a great many infractions of our usual customs of doing business, but in war time, when everything is tense, when everything is high, everyone must make preparations to shoulder his own burden and not try to shove it on to others.

WHAT BUSINESS NEEDS

We have also to look at the future and what we must do to hold our prosperity, and that means an industrial preparedness, because industry is the life and backbone of a nation, and the greatest boon to its people. That means that our government henceforth must become linked absolutely with business. This country must become one vast business organization. That means that government and business absolutely have to work together for national development and the uplift of the people.

Another thing that we need for the future is an amendment or an abolishment of our Sherman anti-trust law—and all of the anti-trust laws. And I insist and demand that for the reason that if co-operation, which is desired to-day by the government and by the people, is an absolute necessity in case of war, it must be of great benefit in time of peace. I do not want business not to be regulated, I do not want business to do as it pleases, but I do want business to have liberty within the freedom of the law.

LET'S HELP THE RAILROADS

There is another thing we need, and that is our railroads. Our railroads have been legislated to death. Our railroads need the support of our government and the trade, and they have not got it. And surely if you could not make any money in your business, and it wasn't paying satisfactory dividends to your stockholders, you would not invest any more money in it. Therefore, can you blame the railroads, and can you blame the people for not investing their money in railroads when the return is so much fraught with dangers? Let us help the railroads get proper recompense so that they can be with us in the development of the country.

GOVERNMENTAL ASSISTANCE IS NEEDED

Another thing we need in this country in the future is export trade. We have had a taste of it and we like it. But in order to keep that export trade we need also governmental assistance, and we need it quickly. We must not fool ourselves, just because we are enjoying a large export trade to-day which was forced upon us by circumstances, that these same circumstances will keep it with us. Far from it. And unless we prepare and fortify our manufacturers with the necessary instruments to do this export trade we won't have any. The first thing we need is the passage of the Webb bill, because it legalizes co-operation. Of course, we have many large factories in this country that are strong enough to undertake to seek export markets, but we do not want only conditions that large concerns can enjoy. We want conditions that are equal to all.

Ties Purchased in 1915

Oak, Including Red and White, Supplied More Than 50 Per Cent of Total Reported Purchased

Statistics that have been compiled by the Government Forest Service on the ties purchased during 1915 in the United States by the steam railroads, electric railways, light, heat and power companies, show that fewer ties were purchased in 1915 than in any year since 1907.

Table I shows the number of ties purchased each year from 1907 to 1911, and for the year 1915, classified according to kinds of wood and arranged in the order of number purchased during 1915. Statistics were not obtained for the years 1912, 1913 and 1914.

Five kinds of wood supplied over 81 per cent of the total number of ties reported purchased in 1915. These were the

TABLE I—NUMBER OF CROSSTIES REPORTED PURCHASED, 1907, 1909 TO 1911 AND 1915, BY KINDS OF WOOD

Kind of Wood	1915	1911	1910	1909	1907
All kinds....	*97,106,651	135,053,000	148,231,000	123,751,000	153,703,000
Oak	49,333,881	59,508,000	68,382,000	57,132,000	61,757,000
South'n pine	14,115,681	24,265,000	26,264,000	21,385,000	34,215,000
Douglas fir..	6,950,910	11,253,000	11,629,000	9,067,000	14,525,000
Cedar	5,122,103	8,015,000	7,305,000	6,777,000	8,954,000
Chestnut ...	4,548,352	7,542,000	7,760,000	6,629,000	7,851,000
Cypress	4,478,612	5,857,000	5,396,000	4,589,000	6,780,000
E. tamarack	2,606,794	4,138,000	5,163,000	3,311,000	4,562,000
W. yellow p.	1,402,836	2,696,000	4,612,000	6,797,000	5,019,000
Lodgepole p.	1,316,819	....	....	....	....
West'n larch	1,251,304	....	....	....	....
Beech	1,173,490	1,109,000	798,000	195,000	52,000
Maple	1,069,547	1,189,000	773,000	158,000	....
Hemlock	859,662	3,686,000	3,468,000	2,642,000	2,367,000
Redwood ...	563,685	1,820,000	2,165,000	2,088,000	2,032,000
Gum	485,466	1,293,000	1,621,000	378,000	15,000
Birch	465,815	....	....	....	....
All other....	1,361,694	2,682,000	2,895,000	2,603,000	5,574,000

*Mileage of railroads reporting ties represent 78.46 per cent of total mileage. Mileage represented for former years not obtainable.

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*Abstract of address recently presented before a joint assembly of the National Hardware Manufacturers' Association and the Southern Hardware Jobbers' Association.

oaks, southern pine, Douglas fir, cedar, and chestnut. While there appears to be no trend toward the use of any one species, more oak was reported than any other kind of wood. This is doubtless due to the fact that oak has the requisite strength and hardness for ties and is available in many localities in large quantities. Oak, including both red and white, supplied 49,333,881 ties, or 50.8 per cent of the total number reported purchased. Yellow pine was second in importance, contributing 14,115,681 ties, or 13.43 per cent of the total number reported. This species is largely used because of its availability and cheapness, and in the case of longleaf pine, because of its durability, also the strength of longleaf pine adds to its desirability.

Table II shows the number of crossties reported purchased by the steam railroads, electric railways, and light, heat and power companies. The total number of crossties reported purchased during 1915 by the steam railroads was 88,498,655, or 91.1 per cent of the total reported by all classes of purchasers.

TABLE II—NUMBER OF CROSSTIES REPORTED PURCHASED IN 1915, BY CLASSES OF PURCHASERS AND KINDS OF WOOD

Kind of Wood	Total	Steam Railroads	Electric Railways and Power Companies
All kinds	97,106,651	88,498,655	8,607,996
White oak	32,461,555	30,160,316	2,301,239
Red oak	16,872,326	15,989,605	882,721
Southern pine	14,115,681	13,226,654	889,027
Douglas fir	6,950,910	6,308,685	642,225
Cedar	5,122,103	4,121,570	1,000,533
Chestnut	4,548,352	2,666,402	1,881,950
Cypress	4,478,612	4,375,012	103,600
Eastern tamarack	2,606,794	2,520,475	86,319
Western yellow pine	1,402,836	1,183,535	219,301
Lodgepole pine	1,316,819	1,254,420	62,399
Western larch	1,251,304	1,196,415	54,889
Beech	1,173,490	1,139,457	34,033
Maple	1,069,547	1,062,086	7,461
Hemlock	859,662	839,924	19,738
Redwood	563,685	270,694	292,991
Gum	485,466	485,466	....
Birch	465,815	462,462	3,353
All other	1,361,694	1,235,477	126,217

The number of ties purchased by the electric railways and light, heat and power companies amounted to 8.87 per cent of the total, a decrease of 281,000 ties in comparison with the number purchased by these companies in 1911. The greater part of those reported were white oak, cedar, and chestnut. Southern pine and red-oak ties were purchased in nearly the same quantities, while fewer birch ties than any other were separately reported.

New Hydroelectric Construction in France

William H. Cole in This Country to Place Orders for the Required Machinery

William H. Cole, engineer for the Union Passenger Railway Company of Richmond at the time of its electrical equipment in 1888, but for most of the time since practicing engineering abroad, is in this country, in charge of three undertakings in which the French government is indirectly interested.

One of these projects is in connection with proposed hydroelectric work in the French Alps and Pyrenees, a development made desirable at this time by the scarcity of coal in France. This work will be undertaken by the Société d'Hydraulique Foncière et Industrielle, recently organized in Paris with a paid-up capital stock of 25,000,000 francs. According to Mr. Cole, most of the hydroelectric machinery required in the developments now to be undertaken by this company will be purchased in America. Allied with this company is a second corporation, the Société Centrale d'Industrie, whose purpose will be to distribute and use this power. The water power first developed will be in the Alps, and part of it will be used for the operation of sections of the Midi Railway. Both of these companies hold franchises for 100 years, granted by the French government.

A third mission being undertaken by Mr. Cole on this trip is in connection with the rehabilitation of the portions of northern France and Belgium retaken from the Germans. This undertaking will be carried out by an organization known as the American Bank Franco-Belgique.

Mr. Cole is a member of the A. I. E. E., and his professional work in the past has included active connection with electric railways in Rio de Janeiro, Buenos Ayres, Mexico City and Singapore.

Large Size Catalog Favored

By F. V. Burton

Eastern Sales Manager Byrant Electric Company,
Bridgeport, Conn.

I am glad to see so much interest in the discussion which is going on in your columns with reference to standard catalog sizes because it indicates very clearly that a standard is desired, and the more agitation on the subject there is the sooner standardization will come.

Our standard catalog is 8 in. x 10½ in., which is the size recommended by Mr. Rice, manager of the publication bureau of the General Electric Company in his article on page 808 of your issue of April 28. The reasons which he sets forth are among those which influenced us in dropping the 6-in. x 9-in. size in favor of the 8-in. x 10½-in. size. Then there is an additional reason, which is important with those manufacturers who, like ourselves, make shelf goods. This is that the same plates used for printing a bound 8-in. x 10½-in. catalog can be used satisfactorily for printing on the 8-in. x 10½-in. sheets of the loose-leaf catalog that is issued by the Electrical Supply Jobbers' Association to its members. As the catalog would probably have a border, it is possible, by omitting the border, to leave a 2-in. margin at the binding edge, which is necessary in a loose-leaf book of this character to prevent the reading matter from being concealed or difficult to read in the fold of the book.

Of four manufacturers in our line of business who have issued catalogs during the past year, three have for the first time used the 8-in. x 10½-in. size, so that it looks as if the industry was standardizing on this size quite rapidly.

President Names Economy Board

President Wilson has named a commercial economy board of the advisory commission of the Council of National Defense. The members of this board are Edwin F. Gay, professor of economics at Harvard; Wallace D. Simmons of St. Louis, George Rublee of New Hampshire, Henry F. Dennison of Massachusetts, Dr. Horace Godfrey and A. W. Shaw of Chicago, chairman. The board is organized to assist the readjustment of distribution during the war by securing the voluntary co-operation of business men in adopting more efficient methods and in cutting down waste. One of the chief objects is to assist commercial houses in releasing employees for the government service without dislocating business.

Electric Properties Corporation

The Electric Properties Corporation, at a special meeting of the stockholders held on May 7, approved the action of the board of directors in taking over the property and business of Westinghouse Church Kerr & Company. The changing of the name of the Electric Properties Corporation to that of Westinghouse Church Kerr & Company, Inc., was also approved. The notice calling the special meeting of stockholders stated that the change in name was for the purpose of effecting economies, particularly in the saving of payment of double federal income and surplus profits taxes.

Gear Manufacturers Meet

The American Gear Manufacturers' Association, the organization of which was noted in the ELECTRIC RAILWAY JOURNAL of April 7, held its second meeting at the Hotel Schenley, Pittsburgh, on Monday and Tuesday, May 14 and 15. The meeting was well attended, there being about twenty gear manufacturers represented.

Papers were presented by the following: S. L. Nicholson, Westinghouse Electric & Manufacturing Company, on "The Ins and Outs of an Industry Organization"; James E. Gleason, Gleason Works, on "The Spiral or Curved Tooth Beveled Gear"; Frank Burgess, Boston Gear Works, on "Industrial

Mill or Job Gearing," and William Ganschow, William Ganschow Company, on "The Advantages of Gear Standardization."

Steel Orders Piling Up

The books of the United States Steel Corporation show that on April 30 there were unfilled orders amounting to 12,183,083 tons. This total makes a new high record and is an increase of 471,439 tons over the tonnage shown at the end of March. The increase in the figures for April was more than was expected. The total of unfilled orders on hand at the end of last month compares with a finished steel capacity of 16,080,000 tons annually. The following table gives the unfilled tonnage at the close of the first four months of each year for 1915, 1916 and 1917:

	1917	1916	1915
January	11,474,054	7,922,767	4,248,571
February	11,576,697	8,568,966	4,345,371
March	11,711,644	9,331,001	4,256,749
April	12,183,083	9,829,551	4,162,244

NEW YORK METAL MARKET PRICES

	May 3	May 19
Prime Lake, cents per lb	31	31½
Electrolytic, cents per lb	31	31½
Copper wire base, cents per lb	36	36
Lead, cents per lb	9⅞	10½
Nickel, cents per lb	50	50
Spelter, cents per lb	9½	9⅜
Tin, Straits, cents per lb	58½	65½
Aluminum, 98 to 99 per cent, cents per lb	60	60

OLD METAL PRICES

	May 3	May 19
Heavy copper, cents per lb	24½	25
Light copper, cents per lb	21½	22
Red brass, cents per lb	18½	18½
Yellow brass, cents per lb	17½	17½
Lead, heavy, cents per lb	7¾	8
Zinc, cents per lb	7	7
Steel car axles, Chicago, per net ton	$41.50	$41.50
Iron car wheels, Chicago, per gross ton	$24	$25.50
Steel rail (scrap), Chicago, per gross ton	$31.50	$31.50
Steel rail (relaying), Chicago, per gross ton	$39	$39
Machine shop turnings, Chicago, per net ton	$11.00	$11.50

CURRENT PRICES FOR MATERIALS

	May 3	May 19
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38	$38
Wire nails, Pittsburgh, per 100 lb	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.85	$3.85
Steel bars, Pittsburgh, per 100 lb	$4.00	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$6.70
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl	$2.12	$2.12
Cement (carload lots), Chicago, per bbl	$2.16	$2.16
Cement (carload lots), Seattle, per bbl	$2.60	$2.50
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.28
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.29
White lead (100 lb. keg), New York, cents per lb.	10¾	11¼
Turpentine (bbl. lots), New York, cents per gal.	52	47

ROLLING STOCK

North Kankakee Electric Light & Railway Company, North Kankakee, Ill., is reported to be in the market for two cars.

Carbon Transit Company, Mauch Chunk, Pa., is reported to be in the market for cars.

Halifax (N. S.) Electric Tramway Company, Canada, is in the market for additional rolling stock, rails, ties and general construction material.

Tampa (Fla.) Electric Company is having fifteen double-end pay-as-you-enter one-man safety cars built for it in the shops of the American Car Company, St. Louis, Mo.

Gary & Interurban Railroad, Gary, Ind., is expected to place an order for two motor and four trail cars within the next week.

Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, noted in the April 21 issue as being in the market for fifteen city cars, has placed this order with the American Car Company.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has placed an order with the G. C. Kuhlman Company for three Peter Witt cars.

Mason City & Clear Lake Railroad, Mason City, Iowa, noted in the April 21 issue as being in the market for three cars, has placed this order with the American Car Company.

Houston (Tex.) Electric Company, noted in the May 12 issue as having eighteen single-end pay-as-you-enter one-man safety cars built for it by the American Car Company, has specified the following details for this equipment:

Number of cars ordered	18
Builder	American Car
Type	One-man safety
Seating capacity	36
Length over bumpers	27 ft. 9½ in.
Length over vestibule	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Rail to trolley base	12 ft. 6 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	None, rafter finish
Roof	Arch
Air brakes	Safety Car Devices Company
Axles	Brill
Bumpers	American Car-channel iron
Car trimmings	Brill
Couplers	None, pull bars used
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Safety Car Devices Co.—air-operated
Hand brakes	American Car—with Pittsburgh ratchet drop brake handles
Headlights	Golden Glow S-M-95
Journal boxes	Brill
Sanders	Keystone air sanders
Sash fixtures	O. M. Edwards
Seats, style	Heywood Bros. & Wakefield 57-S-P
Seating material	Mahogany wood, steel and canvas lined rattan
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trucks, type	Brill 78-M-1 Special
Ventilators	Utility Ventilators
Wheels	24 in. diam., 2½ in. tread, ⅝ in. flange
Special devices	Faraday high voltage push button system

New York State Railways, Rochester Lines, Rochester, N. Y., noted in the March 24 issue as purchasing twenty-five 50-ft. Peter Witt cars from the Cincinnati Car Company through W. R. Kerschner, has specified the following details for this equipment:

Number of cars ordered	25
Date of delivery	September, 1917
Builder	Cincinnati Car
Type	Peter Witt
Seating capacity	53
Weight (total)	31,900 lb.
Bolster centers	26 ft. 0 in.
Length over bumpers	50 ft. 0 in.
Width over all	8 ft. 4 in.
Rail to trolley base	11 ft. ⅛ in.
Body	Steel
Interior trim	Cherry
Headlining	Steel
Roof	Arch
Air brakes	Westinghouse DH.-10
Axles	Forged annealed steel
Bumpers	Channel irons
Car trimmings	Railway Company standard
Conduits and junction boxes	Alphaduct
Control	GE..K-12 with magnetic line switch
Couplers	Drawheads with bars
Curtain fixtures	Curtain Supply, grooved ring fixture
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	National Pneumatic
Fare boxes	Cleveland
Fenders	Eclipse
Gears and pinions	GE. grade M.
Hand brakes	Cincinnati Car
Heaters	Peter Smith hot air
Headlights	Trolley Supply Co.
Journal Boxes	Taylor
Lightning arresters	GE.
Motors	Four GE. No. 258 inside hung
Registers	None
Sanders	Railway Co.'s standard
Sash fixtures	Edwards
Seats, style	Transverse at read end, longitudinal front end
Seating material	Fabrikoid
Springs	Taylor
Step treads	Metal
Trolley catchers	Not yet ordered
Trolley base	GE.
Trolley wheels	Lumen
Trucks, type	Taylor RH.
Ventilators	Not yet decided
Wheels	26 in., cast iron

Puget Sound Traction, Light & Power Company, Bellingham, Wash., noted in the March 24 issue as having had four double-end one-man pay-as-you-enter safety cars purchased for it by Stone & Webster, Boston, Mass., has specified the following details for these cars. Details for twenty-eight single-end cars ordered for the Tacoma properties were reported in the April 28 issue.

Number of cars ordered	4
Builder	American Car
Type	One-man safety
Seating capacity	34
Length over bumpers	27 ft. 9½ in.
Length over vestibule	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Rail to trolley base	12 ft. 6 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining, None	Rafter finish
Roof	Arch
Air brakes	Safety Car Devices Company
Axles	Brill
Bumpers	American Car channel iron
Car trimmings	Brill
Control, type	G.E. K-10
Couplers	None, pull bars used
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Safety Car Devices Company, air-operated
Fare boxes	Johnson, Model D
Fenders	Furnished and installed by railway
Gears and pinions	GE.
Hand brakes	American Car, with Pittsburgh ratchet drop handle
Headlights	Golden Glow, S. M. 95
Journal boxes	Brill
Lightning arresters	GE.
Motors	Two G.E., 258 C., inside hung
Sanders	Keystone air sander
Sash fixtures	O. M. Edwards
Seats, style	Heywood Bros. & Wakefield
Seating material	Mahogany wood, steel and canvas lined rattan.
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trolley base	GE.
Trolley wheels	GE.
Trucks, type	Brill, 78-M-1, special
Ventilators	Utility ventilator
Wheels	24-in. diam., 2½-in. tread, ⅝-in. flange
Special devices	Faraday high voltage push button system, ESS. Co.

TRADE NOTES

Philadelphia (Pa.) Holding Company has received an order from the Hutchinson (Kan.) Interurban Railway for one radial truck.

George W. Neff has taken charge of the Eastern management of the John H. McGowen Company of Cincinnati, Ohio, with offices at 50 Church Street.

General Electric Company, New York, N. Y., is moving its entire offices from 30 Church Street to the Equitable Building, 120 Broadway, where it will occupy the entire twentieth floor.

A. W. Burchard was elected an additional member of the board of directors of the General Electric Company at the annual meeting of the stockholders held on May 8. All of the retiring directors were re-elected.

Frank M. Hawkins, since 1897 managing representative of the New York territory of the Crouse-Hinds Company, will hereafter devote most of his time to export trade. For the present he will investigate the West Indian and the South American trade.

Electrose Manufacturing Company, Brooklyn, N. Y., is distributing a report rendered to the company on a high-voltage test of its insulated connectors, ordered for the W. S. Barstow Company. The tests were made by the Electrical Testing Laboratories.

Packard Electric Company, Warren, Ohio, has established a district office on the fourth floor of the San Fernando Building, Los Angeles, Cal., in charge of J. G. Monahan, district manager. This office will handle all of the territory south of Fresno and also the State of Arizona on all products of the transformer department.

Electric Service Supplies Company, Philadelphia, Pa., recently had a flag raising at its factory which was attended by several hundred employees of the company. The flag, which is illuminated by three Golden Glow floodlighting projectors, was raised after appropriate ceremonies in which all participated.

Bound Brook (N. J.) Oil-less Bearing Company has awarded a contract for a new foundry to be erected at plant No. 2, Lincoln, N. J., which is located 2 miles east of the Bound Brook plant. The new two-story, steel-and-brick building will be 80 ft. x 180 ft. and will be completed by Aug. 1, 1917.

McHenry & Murray, New Haven, Conn., announce that this engineering firm has been dissolved by mutual consent of the partners. Mr. Murray will hereafter devote his entire time and attention to the interests of the Housatonic Power Company, of which he is president, and Mr. McHenry will retire to private life.

Frank W. Marvel, with headquarters in Philadelphia, has been appointed special representative in the Eastern territory for the Indianapolis Switch & Frog Company, Springfield, Ohio. For the past seven years Mr. Marvel has been identified with the Buda Company as sales engineer with headquarters in Chicago.

Railway Track Tamping Machine Company, Lewiston, Me., has recently been organized for making railway track bed machinery. The company is capitalized for $75,000. William P. Barrell is president and C. L. Emerson, treasurer, and these two with Nicola Talarico and H. C. Barrel are directors.

Duquesne Electric & Manufacturing Company, Pittsburgh, Pa., is the new name adopted by the Service Supply & Equipment Company, dealer in second-hand electrical equipment and contractor for electrical repair work. The new company has opened a large repair shop at East Liberty, Pa. The sales offices, however, still remain in the Bessemer Building..

Casey-Moorehead Engineering Company, Pittsburgh, Pa., consulting electrical engineer, has opened offices in the Bessemer Building. The company will furnish appraisals, estimates, reports and specifications on electrical apparatus applied to industrial plants and coal mines. Both Mr. Moorehead and Mr. Casey were formerly with the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

C. P. Donahue has been appointed sales manager of the Electric Materials Company, North East, Pa., effective May 1. Mr. Donahue has been with the company since February, and prior to that he was employed by the Westinghouse Electric & Manufacturing Company at East Pittsburgh for fourteen years, during which period he had several years of practical shop work, the remainder of the time being connected with the sales department.

National Conduit & Cable Company, Inc., New York, N. Y., noted in the April 28 issue as having been reorganized under the laws of New York State with a capitalization of $8,700,000, has elected the following board of directors: Edward S. Perot, Edward S. Perot, Jr., Morton A. Howard, George J. Jackson, Albert H. Wiggin, president Chase National Bank; C. E. Mitchell, president National City Company; Andrew Fletcher, president American Locomotive Company; Stephen Millett of Millett, Roe & Hagen; Robert Montgomery of Montgomery, Clothier & Tyler, and Hugh K. Prichitt of Prichitt & Company. Edward S. Perot is president; Edward S. Perot, Jr., vice-president; Morton A. Howard, secretary, and George J. Jackson, chairman of the board.

Railway Tie Corporation, 2007 Railway Exchange Building, St. Louis, Mo., recently incorporated, has purchased the patent rights on a combined wood and steel tie from the Illinois Railway Tie Company and also on a metallic tie from the National Tie Company. The company has decided to build its own manufacturing plant, as it is impossible to get ties made to fill several large orders now on hand, on account of the congestion in the steel mills. The company also has offices in Chicago, 1531 Lytton Building, and in Philadelphia, 810 Commercial Trust Building. J. H. Stube is president, Chicago, W. F. Sloan, vice-president, Chicago, A. L. Taylor, second vice-president, Harrisburg, Pa.; J. F. Sweeney, treasurer, Chicago; F. W. Burk, secretary, Chicago, and F. A. Swisher, assistant secretary, Philadelphia.

NEW ADVERTISING LITERATURE

American Steel Foundries, Chicago, Ill.: An attractive folder containing a poem, "The Evolution of the Wheel," by A. Trevor Jones.

Stow Manufacturing Company, Binghamton, N. Y.: Copies of miniature bulletins No. 101 and 102 on electric tools and flexible shafts.

B. S. Barnard & Company, New York, N. Y.: Booklet of conduit specialties and tools for removing obstructions in underground conduit systems.

Dielectric Manufacturing Company, St. Louis, Mo.: A catalog on insulation, paints and varnishes. Contains useful curves showing the electrical characteristics of the different insulating materials.

National Tube Company, Pittsburgh, Pa.: Bulletin No. 27 on the uses of National pipe. Contains a sixteen-page section of tables and data about the physical properties of National pipe of interest to the engineer.

John C. Dolph Company, Newark, N. J.: A catalog which will enable the users of insulating varnishes to select the type of varnish most suitable for their apparatus. All varnishes listed under trade names, qualities and characteristics.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Catalog 5A on insulating materials and supplies. Specifications and uses of mica, micarta, bakelite-micarta for gears and pinions; treated and untreated cloths and papers; varnishes, shellacs, cement, glue and switch oil.

General Electric Company, Schenectady, N. Y.: Bulletin No. 47,477 on 45,000 to 70,000-volt type F, form KO-26 oil circuit breakers for outdoor service. This breaker is usually mounted on framework to allow for easy removal of oil vessels with the help of a tank-lifting device. Breakers made with or without bushing type current transformers for indicating or tripping purposes.

Railway Improvement Company, New York, N. Y.—Publication which resembles in appearance a Rico coasting recorder. Explains use of comparative efficiency charts, gives efficiency records, service department figures for all roads on which recorders are installed, announces some recent accessions to the rapidly increasing number of users of coasting recorders, and explains the use of Rico efficiency service in rewarding efficient and skilled motormen.

The November Pooka

This particular breed of **Pooka** enjoys the gift of prophecy so far as what will happen the following November is concerned.

We enjoy that circumscribed but sure sort of prophecy ourselves.

We don't pretend to know what will happen when you buy a certain kind of trolley wheel, ventilator, heater, controller or the like.

But we do know what will happen when you buy a certain kind of brake.

If it's the **Peacock,** we hereby prophesy unalloyed satisfaction and prosperity—and we've made good in our brake prophecies for years and years.

The Eccentric Drum

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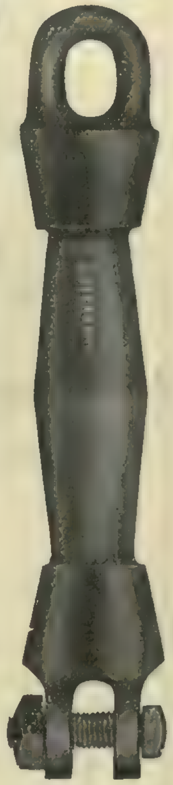

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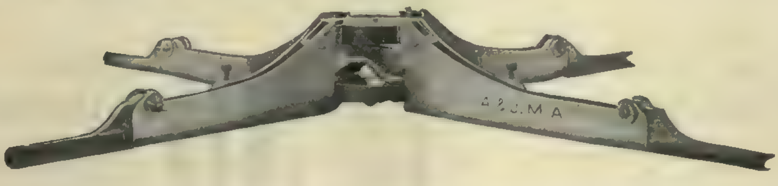

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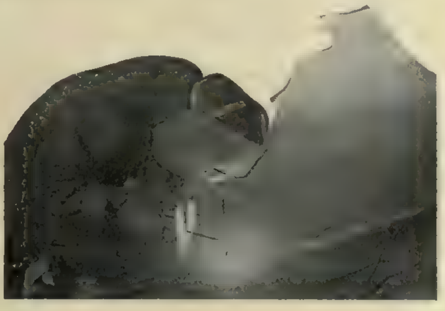
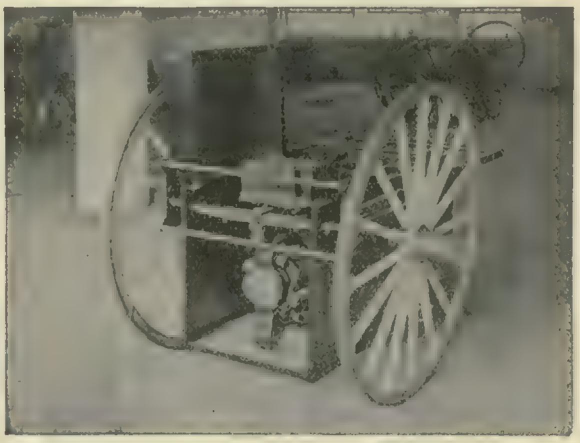
Lincoln Bonding System

enables two men to install bonds at the rate of 30 per hour. Any road equipped with a Lincoln bonding machine can rapidly install bonds that will insure a return circuit of maximum conductivity.

No drilling, no grinding. The electric arc throws off the scale, rust or dirt, and leaves a clean welding surface.





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The fact that we have saved from 20 to 50 cents per bond for others proves that we can do the same for you.

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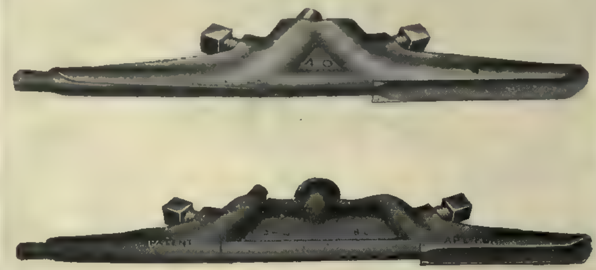

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Samsons are easily and quickly installed, stay upright in the span, provide a smooth, non-arcing under-run and have strength in excess of new wire.

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Standardizing on Samsons is an easy way to make the funds available for maintenance work do double duty. You gain on labor, time and money saved.

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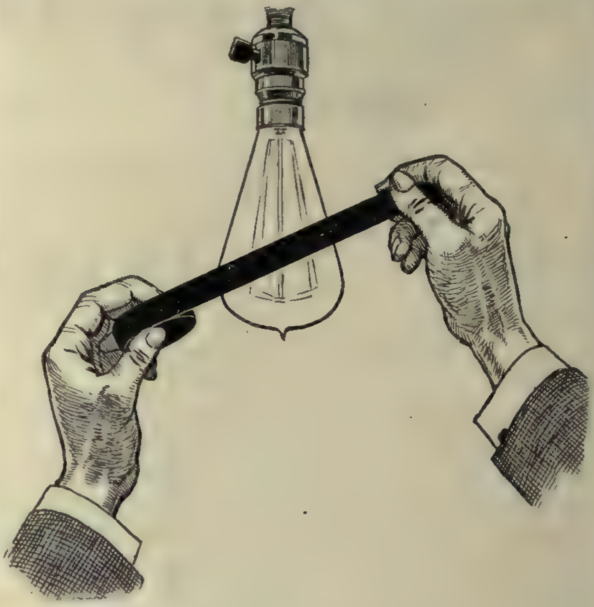

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The various brands of Friction and Rubber Tapes made by this company fully

Meet Your Expectations

The compounds are unusually smooth and even, and the fabrics are closely woven and uniform.

They unroll easily, and are especially adhesive and durable.

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the most potent weed exterminating compound on the market.

"ATLAS A" applied now assures you absolute immunity from weeds for the entire season.

Our contract service covers the Atlas "A" weed killer, applied with our sprinkling equipment, supervised by our weed experts. And we can do the job at the rate of 15 to 50 miles of track per day.

Write us your conditions—let us send you an estimate.

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Show sustained economy after years of operation
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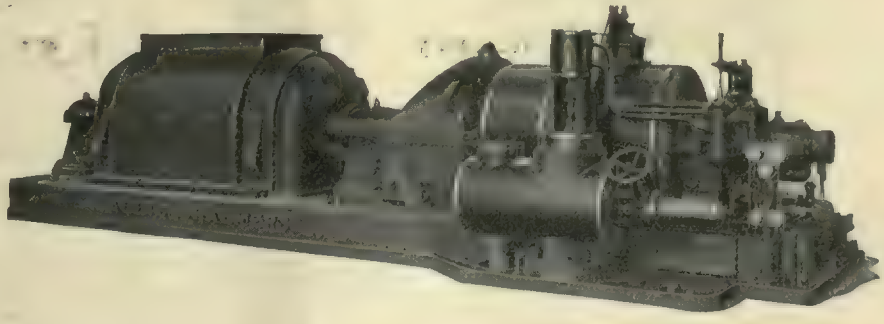

3200 KW., Max. 3600 R.P.M., H. P. Condensing Steam Turbine and Alternator. Unit of this size installed in the plant of the Eastern Pennsylvania Ry. Co., Palo Alto, Pa.

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We've studied them. We've developed the metal every way adequate for the service. You get it in

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When you order "Tiger" Bronze Bearings you get the benefit of over forty years' foundry practice; the resources of a highly efficient staff of metallurgical chemists; the best material possible to obtain; the most careful methods of mixing; an exclusive process of casting.

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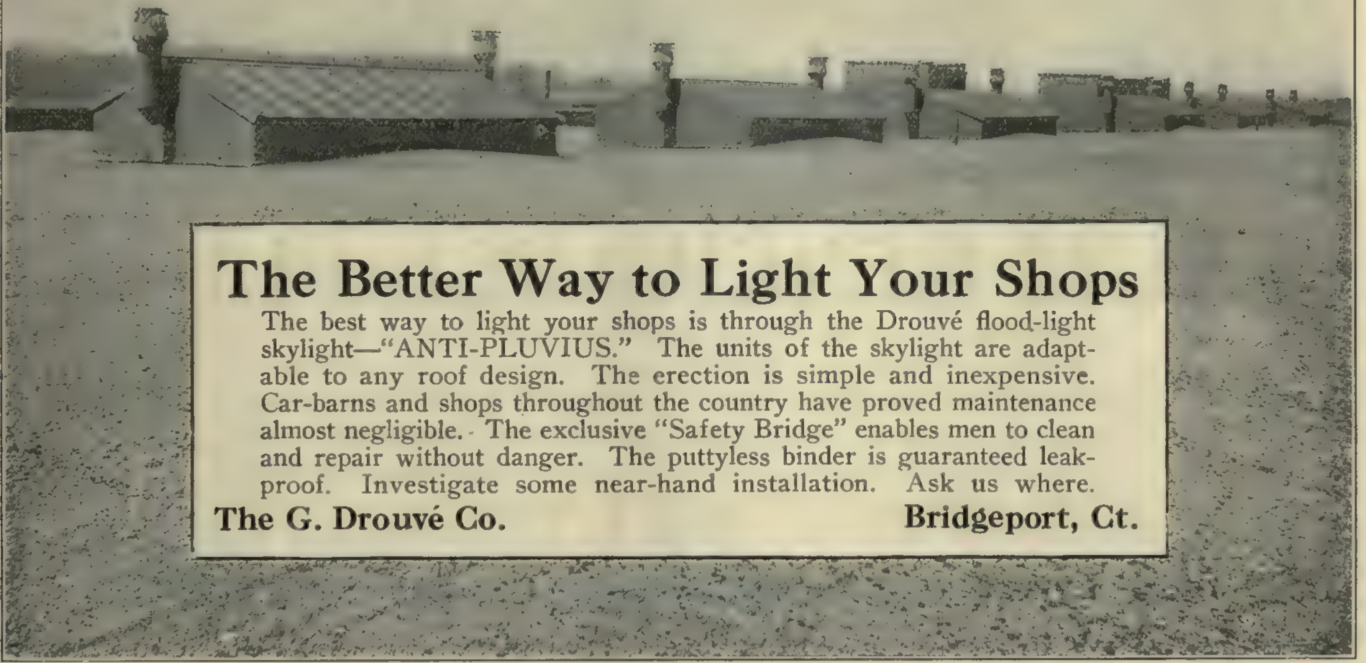

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The best way to light your shops is through the Drouvé flood-light skylight—"ANTI-PLUVIUS." The units of the skylight are adaptable to any roof design. The erection is simple and inexpensive. Car-barns and shops throughout the country have proved maintenance almost negligible. The exclusive "Safety Bridge" enables men to clean and repair without danger. The puttyless binder is guaranteed leakproof. Investigate some near-hand installation. Ask us where.

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As evidence that the Monroe promptly met the need, we quote from their letter:

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Whether applied to the simple counting of the money turned in by the conductors or to the most elaborate calculations of the balance sheet, the operating simplicity, speed, accuracy and self-checking features of the Monroe will save from 50% to 75% in time and eliminate needless checking and expensive errors.

The best way for you to satisfy yourself whether the Monroe will ever be an economy on your work is by direct application. Since there is no charge or obligation, may we have the coupon by return mail?

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Please send (check the item desired):

☐ Full information as to how we may use the Monroe to advantage on all the figure work in our department.

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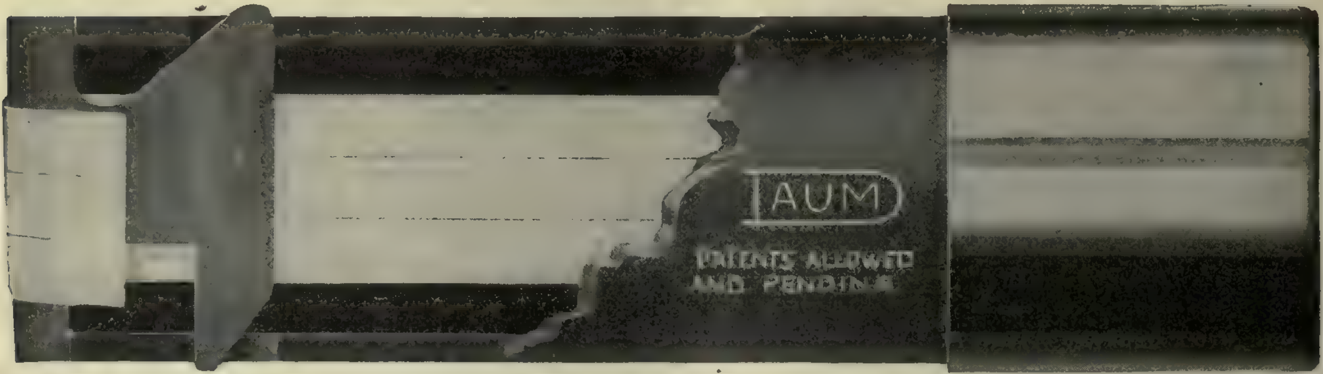

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But the initial cost of breakers and their impracticability in some places prohibits their use.

When a Daum Fuse goes—all you have to do is cut another piece of fuse strip—insert it in the cartridge—and replace.

You'll never be caught out of fuses. Daum Cartridges and fuse strips are furnished in all sizes and capacities.

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WE are in a position to furnish complete machine tool equipment for electric railway repair shops, including steam hammers and electric traveling cranes.

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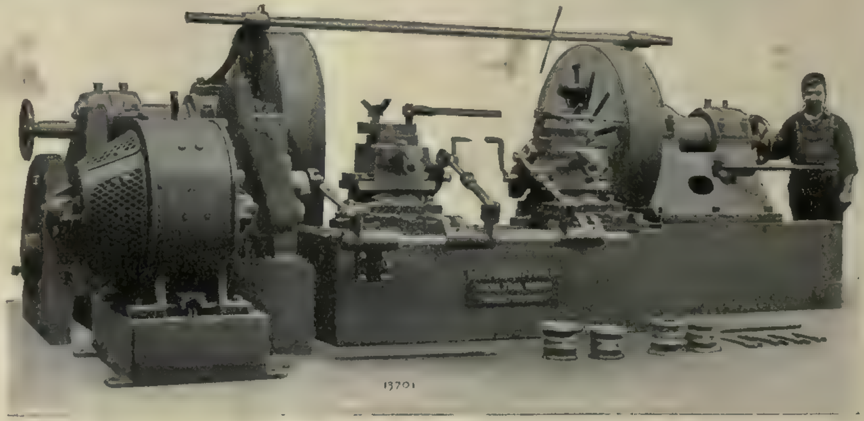

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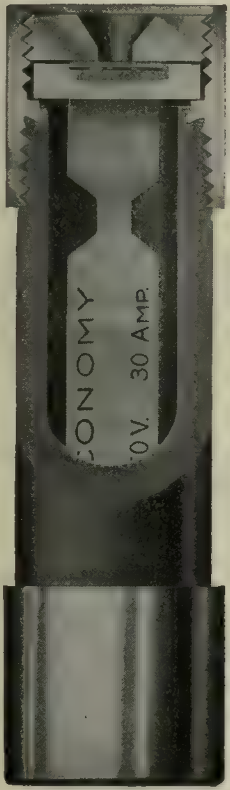
Isn't a Saving of 80% a year in fuse costs (with safety) worth while?

SAFETY FIRST ECONOMY renewable cartridge FUSES



"Look for the Gray Shell"

That's what the use of

ECONOMY Renewable Cartridge FUSES

is effecting for users who previously used the non-renewable type.

Why throw away a fuse when it has blown? It's a waste that can be avoided. Economy renewable fuses will save you 80% of that wasted expense. Thousands of users—millions in use.

Write for Catalog 17 and free samples, stating the capacity and voltage desired. We want every electric railway to try them.

ECONOMY FUSE & MFG. COMPANY
Kinzie and Orleans Sts., Chicago

"Yes— **ROLLER LOCK NUTS** are the first real self-tightening nuts ever produced"

Part of Steel Cover Removed to Show Locking Roller and Brass Arm

When you get a shipment of them, you get **3 in 1**—A Lock Nut, a Self-tightening nut, a Plain nut—they'll make your equipment tight and KEEP IT TIGHT.

Used alone, and reusable many times.

Locks on to worn and undersized bolts.

Same size as ordinary nut.
Applied and removed like plain nut.
You can hit it with hammers.
And best of all—their initial cost is not more than present devices, while ultimate economy is enormous.

Send for catalogs and prices.

61 Broadway, New York **ROLLER LOCK NUT CO.,** 9 No. Jefferson St., Chicago

The demand for our material is so great that we earnestly recommend our customers to anticipate their needs as much as possible.

STANDARD STEEL WORKS CO.
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One of fifteen new

Jewett Steel Cars

Ordered by the Northern Ohio Traction & Light Co.

Seven of them have baggage compartments—eight have smoking compartments. All have spacious white enameled saloons with running water, etc. Pressed steel posts—steel plates throughout—steel grained mahogany interior finish—chanarch and composition flooring with battleship linoleum in aisles—these are some of the details of these "cars of character."

Let us bid on your specifications.

THE JEWETT CAR CO., Newark, Ohio

A NACHOD

Crossing Signal

guarding a highway crossing on the Nashville Interurban Railway.

They make treacherous, hidden crossings—safe because

Nachod Spells Safety

NACHOD SIGNAL CO., Inc.
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STEEL POLES For every pole purpose

Bates Steel Poles in use by the DES MOINES CITY RAILWAY, Des Moines, Iowa, U. S. A.

Strongest STEEL POLE of like weight in the world.
Best STEEL POLE in the world for electric railway trolley service.
Most artistic STEEL POLE in the world for any service.
We make the lowest prices.
We have constantly on hand about two thousand tons of steel and can make immediate shipments.
A full line of convenient malleable fittings.
Our steel pole TREATISE tells a big story, ask for it.

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Direct Contact Between
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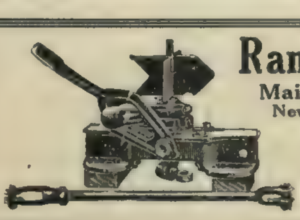

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ALUMINUM
Railway Feeders
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Aluminum feeders are less than one-half the weight of copper feeders and are of equal conductivity and strength. If insulated wire or cable is required, high-grade insulation is guaranteed. Write for prices and full information.

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We Are Able to Supply
your requirements of bare and insulated electric wires and cables and cable accessories. Stocks of wire and cables are ordinarily carried at convenient shipping points throughout the United States.
Write our nearest office.
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Bare and Insulated Wires and Cables.
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TREATED POLES, CROSS ARMS, TIES, TIMBERS, PAVING BLOCKS
CAPACITY 100,000,000 FEET B. M. PER ANNUM
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"NATIONAL" Tubular Steel Poles
for Telegraph, Telephone Electric Light and Electric Railway Construction. Write for literature
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We brag about the SERVICE we give
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Three Section Tower Outfits to fit any make of chassis.
Write for literature and prices.
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WRITE FOR OUR NEW DESCRIPTIVE CATALOG.
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Beats Solid Copper 40 Ways
Cheaper—Lighter—Stronger—Higher Elastic Limit—Costs Less to Maintain
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TOOLS
for all classes of electrical construction and repair work. Write for catalog.
Mathias Klein & Sons Canal Station 25 Chicago

Peirce Forged Steel Pins with Sheet Steel Thimbles
Your best insurance against insulator breakage
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SPECIAL TRACK WORK

Built to withstand
severe service

SWITCHES
FROGS
CROSSINGS
and
COMPLETE
LAYOUTS

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"ACME" (NESTABLE)

Corrugated NO-CO-RO METAL Culverts
now qualify as city beautifiers!

The installation shown takes the place of an unsightly ditch that ran through the entire length of a City in Montana.

Understand, reinforcing of "ACME" Culverts with concrete is not necessary. The NO-CO-RO METAL, of which "ACME" Culverts are made, is of such high corrosion-resisting quality as to make it ideally adapted for use in connection with concrete for permanent construction.

Catalog G-3 offers a lot of suggestions. Write for a copy.

THE CANTON CULVERT & SILO CO.
MANUFACTURERS
CANTON, OHIO, U.S.A.

AWARDED PANAMA PACIFIC INTERNATIONAL EXPOSITION GRAND PRIZE

American
Rail Bonds

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WE MAKE THIS GRADE ONLY

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T RAILS AND NELSONVILLE FILLER AND STRETCHER BRICK

offer all the advantages without the disadvantages of the groove rail.
Construction approved by City Engineers.

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Keep a good commutator in condition for maximum service by using

DIXON'S Graphite Brushes

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Tongue Switches, Mates, Frogs, Curves and Special Work of all kinds for Street Railways

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GREEN CHAIN GRATE STOKERS
For Water Tube and Tubular Boilers
GREEN ENGINEERING CO.
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Bulletin No. 1—Green Chain Grate Stokers
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Have You Ever Analyzed the Heap of Junk in Your Yard?

Do you realize that a large percentage of the tubes, flues, and grates that compose it have had their uselessness hastened by bad feed water conditions?

Scale, Corrosion, Foaming, Pitting and Bagging quickly reduce boilers to junk. Overheating in an effort to offset the reduced steaming efficiency caused by scale, speedily burns out the tubes, and steam leaks produce bad effects on the grates, and also have a tendency to destroy the brick work of the furnace.

It is therefore easily appreciable that

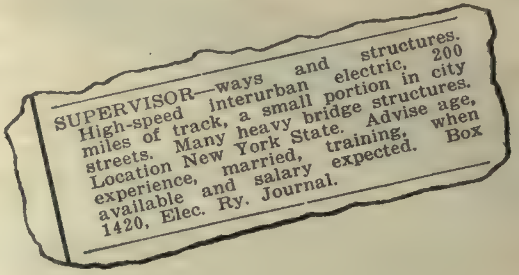
Dearborn Treatment

which is a certain corrective for all feed water troubles, prolongs the life of not only the water containing parts of your boiler, but saves furnace parts as well.

Dearborn Treatment can be depended upon to keep the boilers in good condition. It is made in each case to handle the conditions shown by analysis of the water, and provides reagents for all the injurious mineral salts contained, so that it not only prevents scale formation, but overcomes corrosion, pitting and foaming.

Dearborn Chemical Company
McCormick Bldg., Chicago

We can help YOU, too



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I wish to congratulate you on the results obtained.

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Chief Engineer.

Above ad cost only $2.05 an insertion and was published but three times. This is only one example among many of the pulling power of the JOURNAL'S Searchlight Section.

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Steam Superheaters Mechanical Stokers

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Greatly Increase Efficiency and Power of Steam Turbines.
POWER SPECIALTY CO.
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CIRCUIT I-T-E BREAKERS
PHILADELPHIA

I. T. E. Circuit Breakers

for heavy street railway work are the best obtainable. Write for New Complete Catalogue.

Murphy Automatic Furnace

CONSERVES energy and triples the steaming capacity of your boilers. Write for Catalog "C."

MURPHY IRON WORKS
Detroit, Mich. U.S.A.

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A Further Guarantee of Service on

Transformers

Additional manufacturing and storage facilities and further specialization on our line enable us to maintain the well-known Packard service on a larger scale than ever.

The quality of our instruments will be as always, the best the industry can produce.

Write for Bulletin E. R. J.-200.
It's a transformer text-book.

The Packard Electric Company
Warren, Ohio

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Barrett Track and Car Jacks
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KINNEAR Steel Rolling Doors
FOR CAR HOUSES

Compact, Durable, Easily and Speedily Operated and Fireproof. Openings of any size may be equipped and the doors motor-operated if desired. Manufactured by the
KINNEAR MANUFACTURING CO., Columbus, Ohio
BOSTON PHILADELPHIA CHICAGO

COMMUTATORS
Original Manufacturers' Dimensions
Write for new bulletin
THE EUREKA CO., North East, Pa.

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A Chain Hoist that excels in every feature. It has Planetary Gears, Steel Parts, 3½ to 1 factor of Safety. It's the only Block that carries a five-year guarantee.

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CARBOLIC-OL

The Efficient Preserver of Woods.
A Pure Anthracene Oil

COVER THE EARTH

For Brush or Dip Treatment of Bridge Timbers, Poles, Ties, Cross Arms, Pins, Platforms, etc.

Specifications and prices on request.

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Paint and Varnish Makers
601 Canal Road, N.W., Cleveland, O.

Oxweld Acetylene Co.

Largest Makers of Oxy-Acetylene Welding and Cutting Equipment in the World.

Originators of the Oxweld Process

Full information on all classes of Welding and Cutting will be sent on request.

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Woven Fabric Co.
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The Big Three
D & W Fuses, Deltabeston Wire
Delta Tape
D & W Fuse Co., Providence, R. I.

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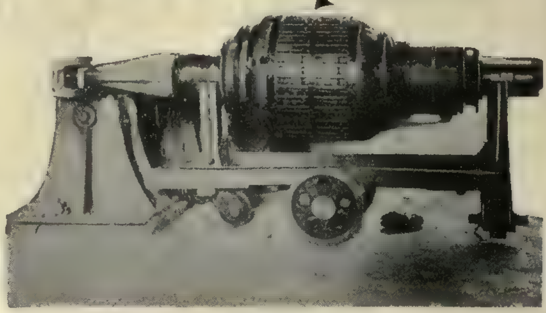
your armatures here



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Insulating Varnishes

Standard Elec. Black Finishing
or
Standard Black Finishing
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Standard Varnish Works

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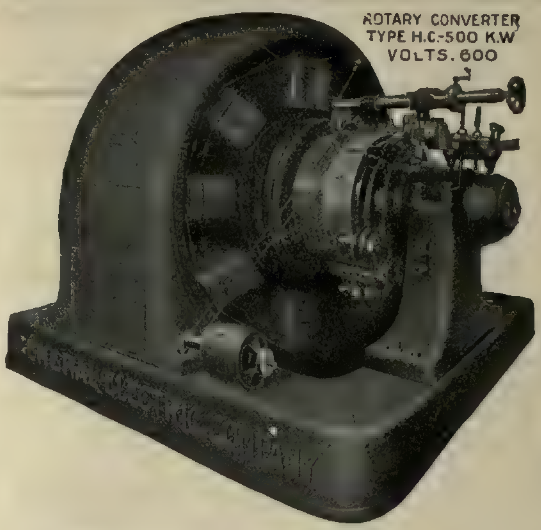

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Jordan Bros., New York, N. Y.

Gentlemen: If you will refer any of your prospective customers to us we will give you a good send-off, as your machine has saved us lots of money by its use on our rotary commutator.

Yours truly,
Chas. J. Zell, Supt.
Public Service Corp. of New Jersey, Orange, N. J.

JORDAN BROS., Inc., 76 Beekman St., N. Y. City

P & B Insulation

guarantees good electrical service. Electric railway men have been buying P & B Products for 32 years—good evidence of quality.

P&B

- Weatherproof Tape
- Insulating Compound
- Baking Varnishes
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- Solid Compounds

Write for Booklets

The Standard Paint Company

Woolworth Building, New York
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A Single Segment or a Complete Commutator

is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command our utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we make, as well as to every commutator we build. That's why so many electric railway men rely absolutely on our name.

Cameron Electrical Mfg. Co.
Ansonia, Connecticut

7233

Full Power with High or Lower Adjustment

Many emergencies requiring a powerful jack present a difficulty in bringing the jack to bear on the load. The

Buckeye Emergency Jack No. 239 Special

saves time, strength and trouble. The many positions to which it is adjustable easily solve perplexing lifting problems. Full details in our catalog. Write for it.

The Buckeye Jack Mfg. Co.
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5

The Best Shade Rollers for Cars

SPECIAL shade rollers for cars, that will last and give satisfaction for years, and yet cost but little more than the poorest you can buy, are made by the Stewart Hartshorn Co., E. Newark, N. J. This company is by far the largest shade roller manufacturer in the world. It is able to give high quality at lower prices because of the enormous output. Write for catalog, stating wants. You are always protected when you buy shade rollers if they bear the signature Stewart Hartshorn

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The Standard for Speed, Accuracy, Durability

B-V Visible Punch

Look for this
B-V.
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BONNEY-VEHSLAGE TOOL COMPANY
124 Chambers Street, New York City
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PANTASOTE

The National Standard
for Car Curtains and
Car Upholstery

AGASOTE HEADLINING

The only headlining made in one solid piece. Will not separate, warp or blister. Waterproof and homogeneous.

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Cleveland Fare Box Co.
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Cleveland, Ohio

No. 300-A Walkover Seat

Back-reversing mechanism travels in a Steel Channel Track, making reversing easy, true and noiseless; a carman readily reverses two rows of seats simultaneously. Pressed Steel End Plates firmly support the Metal Mechanism and Steel Connecting Rails, which in turn are securely riveted to the Pressed Steel Oval Pedestal, making a seat-frame that is well calculated to withstand the hardest usage and outlast the car itself.

The simplicity of the mechanism has been found from a mechanical standpoint, a large factor in decreasing maintenance costs.

Hale & Kilburn Diagonal Corner Grip Handle ensures safety and satisfaction to the standing passenger.

WALKOVER

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Hale and Kilburn Co.

Philadelphia New York Chicago
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Quickly—Quietly—Surely

That describes perfectly the operation of

Consolidated Door Engines

And they keep the doors positively locked.

They don't overload your compressors—air used only in opening or closing. After the operation they automatically shut off the air.

Write for further information.

Consolidated Car-Heating Co.
New York Albany Chicago

WE CAN CUT YOUR COST OF
HEATING CURRENT
Write for THERMOSTATIC CONTROL INFORMATION

GOLD

ELECTRIC HEATERS Cut Installation and Maintenance Charge.
VENTILATORS Also Ventilate in Stormy Weather.
THERMOSTATS Save Current.
ORIGINATED the use of NON-CORROSIVE Wire for Electric Car Heaters.
ORIGINATED The Ventilated Coil Support.

LET US FIGURE ON YOUR NEXT REQUIREMENTS
Gold Car Heating & Lighting Co., 17 Battery Pl., New York

For the Answer to your Fare Collection Problems
Write for
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It tells how the
BONHAM TRAFFIC RECORDER
Will Meet Your Needs
The Bonham Recorder Co., Hamilton, Ohio

HEATING AND VENTILATING YOUR CARS is the problem to-day. Let us show you how to do both with one equipment. Now is the time to consider this change before you start your cars through the shops for overhauling. Kill two birds with one stone.

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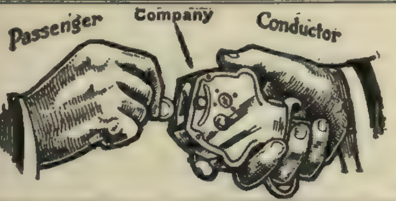

Direct Automatic Registration
By the
Passenger

Rooke Automatic Register Co.
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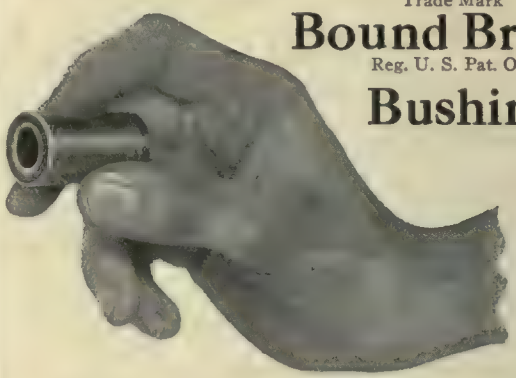
Ventilation—Sanitation—Economy—Safety
All Combined in
The Cooper Forced Ventilation Hot Air Heater
Patented September 30, 1913. Ask for the full story
We also Manufacture Pressed Steel Hot Water Heaters
THE COOPER HEATER CO. CARLISLE, PA.



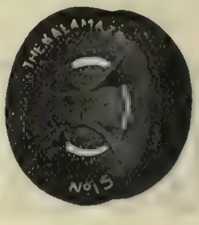
A Recessed

Trade Mark
Bound Brook
Reg. U. S. Pat. Off.
Bushing

This is a close-up of a Bound Brook trolley wheel graphite bushing, showing the neat groove recessed in each end for the insertion of graphite to take care of any end thrust. The graphite placed in these recesses goes through the same careful course of thorough preparation, as the graphite within the casting.

All genuine graphited "Oil-less" Bearings have always been made at Bound Brook, N. J., in the United States of America, by the

Bound Brook Oil-less Bearing Co.
FORMERLY
Graphite Lubricating Company



The Kalamazoo Trolley Wheels

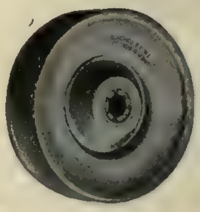
have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.

THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

PROVIDENCE **H-B**
FENDERS LIFE GUARDS
The Consolidated Car Fender Co., Providence, R. I.
Manufacturers of The Providence Fender and H-B Life Guard
Wendell & MacDuffie Co., 61 Broadway, New York
General Sales Agents

"GLOBE" VENTILATORS

An Efficient Ventilator
at a reasonable price
Globe Ventilator Co., Troy, N. Y.



These wheels are good to your wire

Union Standard Trolley Wheels are designed to give maximum life with minimum wear on the wire. Cast of clean, new metal, perfectly balanced and grooved. Designs for high speed or slow, heavy service.

We also have in stock all sizes of Ideal Trolley Wheels.

Ask for our special Trolley Wheel Catalog

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Pittsburgh

Holden & White

Electric Railway Sales Distributors for:

Wasson Air-Retrieving Trolley Bases. (U. S.)
Garland Ventilators.
Perry-Hartman Self-Centering Center Plates and Anti-Friction Side Bearings.
Watson Car Lighting Regulator.
Anderson Brake Slack Adjusters.

Chicago District Representatives for:
Drew Line Material.
Columbia Car & Shop Equipment.
Miller Trolley Shoe.
Lincoln Rail Bonding and Bonds.

1508 Fisher Building **CHICAGO**

RAILWAY UTILITY COMPANY
Sole Manufacturers
"HONEYCOMB" AND "ROUND JET" VENTILATORS
for Monitor and Arch Roof Cars, and all classes of buildings; also
ELECTRIC THERMOMETER CONTROL
of Car Temperatures.

721 W. FULTON ST.
Chicago, Ill.

Write for Catalogue

1328 BROADWAY
New York, N. Y.

Use them in your terminals—
PEREY TURNSTILES
or PASSIMETERS
Faster than the ticket seller
Perey Manufacturing Co., Inc.
30 Church Street, New York City

"Zero" AND "Motor"

STANDARD for a THIRD of a CENTURY

The Mileage Babbitt

Post's ZERO and MOTOR metals have been standard for a third of a century in shops where mileage records are attained. Nothing but highest grade of virgin raw materials used.

Write us for details.

E. L. Post & Co., Inc., Sole Mfrs., 50 Cliff St., New York City

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Steel for Service

There is too much at stake from a safety standpoint, to say nothing of other conditions, to warrant the use of any but the best wheels in the present service on electric roads. More than 200,000

Carnegie Rolled Steel Wheels

are now in such service.

Carnegie Steel Company

General Offices, Pittsburgh, Pa.

869

The Baldwin Locomotive Works

Philadelphia, Pa.

ELECTRIC MOTOR and TRAILER TRUCKS

COOL RUNNING—LONG WEARING

It is where traffic conditions on electric railways call for hard, heavy work that you will find the trucks fitted with AJAX Car Brasses. This is because AJAX Car Brasses run cool, wear long, resist road shocks, are economical, and give unusual satisfaction in every way. Specify AJAX for repairs and new equipment.

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Established 1880

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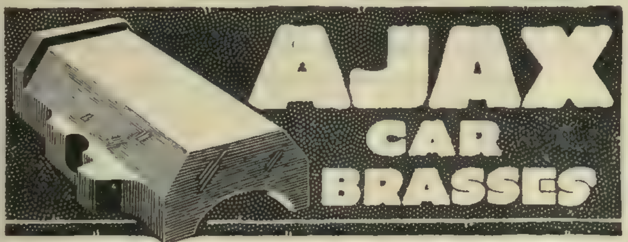

STUCKI SIDE BEARINGS

are truly frictionless. The roller instead of turning on a pin rolls freely like a rolling pin.

A. Stucki Co.
Oliver Bldg.
Pittsburgh, Pa.

MASON SAFETY TREADS—prevent slipping and thus obviate damage suits.

KARBOLITH CAR FLOORING—for steel cars is sanitary, fireproof and light in weight.

STANWOOD STEPS—are non-slipping and self-cleaning.

Above products are used on all leading railways. For details address

AMERICAN MASON SAFETY TREAD CO.

Main Offices: Lowell, Mass.
Branch Offices: Boston New York City, Chicago, Philadelphia, Kansas City, Cleveland, St. Louis.

UNIVERSAL ANTI-SLIP TREADS

cars and station steps.

Universal Safety Tread Company
Waltham, Mass.

The Eclipse Railway Supply Co.

CLEVELAND, OHIO

Manufacturers of the

ECLIPSE LIFE GUARD **ECLIPSE WHEELGUARD**
ECLIPSE TROLLEY RETRIEVER **ACME FENDER**

VAN DORN COUPLERS

are made for every condition and requirement. M. C. B. Pin and Link, Car and Air, in all sizes and types.

VAN DORN COUPLER CO.
2325 So. Pauling St., Chicago, Ill.

SEARCHLIGHT SECTION

FOR SALE

CARS

5—15 bench open cars with motors, trucks and air-brake equipment.

4—13 bench open cars with motors, trucks and air-brake equipment.

12—10 bench open cars with single trucks and motors.

4—20 ft. closed cars with single trucks and motors.

MOTORS

8—Brand new G.E. 201-H, 65 H.P. railway motors complete.

10—Brand new West. 306, 50 H.P. railway motors.

8—Brand new West. 317-A, 90 H.P. railway motors complete.

AIR COMPRESSORS

35—Second hand AA 1 air compressors.

CABLE

10 miles S.H. 500,000 C.M. T.B. weather-proof concentric laid copper cable, weighing approximately 10,000 pounds to the mile.

For further particulars apply to

W. R. KERSCHNER COMPANY, INC.
50 Church Street, New York, N. Y.

Rotary Converters

25 Cycle

One 1500 KW. Gen. Elec. HC-N, 6 ph., 263 V. D.C., 14 pole, 214 RPM.

One 600 KW. Gen. Elec. TC-A, 3 ph., 600 volt D.C., 375 volt A.C., 8 pole, 375 RPM.

Four 500 KW. Gen. Elec. HC-K, 600 volt D.C., 4 pole, 750 RPM., each rotary complete with three 165 Kva. Gen. Elec. OI SC transformers, HP-RP, 6600/5940 volts prim., 430/286/143 volts sec., also necessary panels with instruments.

One 500 KW. Westg. 3 ph., 550 volt D.C., 390 volt A.C., 6 pole, 500 RPM., with dir. conn. starting motor; A.C. and D.C. panels, and three 175 KW. Westg. oil cooled transformers, 13200 volts prim., 390 volts sec.

One 250 KW. Gen. Elec. TC-A, 3 ph., 550 volts D.C., 350 volts A.C., 4 pole, 750 RPM.

Two 250 KW. Gen. Elec. TC-D, 3 ph., 275 volt D.C., 169 volt A.C., 4 pole, 750 RPM., each with A.C. & D.C. panels, and three 100 KW. G. E., type H, single ph., oil cooled transformers, 6600/5600 volts prim., 176 volts sec.

60 Cycle

One 500 KW. Gen. Elec. HC., 6 ph., 600 volt D.C., 424 volt A.C., 6 pole, 1200 RPM., with switchboard panel and three 185 Kva. G. E., OI SC single ph. transformers, 2300 volts prim., 424 volts secondary.

One 300 KW. Westg. 2 ph., 525/575 volt D.C., with two 165 KW. Westg. oil insulated transformers, 2200 volt prim., 367/430 volt sec.

One 200 KW. Westg. 3 ph., 600 volt D.C., 370 volt A.C., 10 pole, 720 RPM., with dir. conn. starting motor.

One 100 KW. Westg. 2 ph., 550 volt D.C., 8 pole, with dir. conn. starting motor.

MacGovern & Company
INC.
114 Liberty Street, New York City

IMMEDIATE SHIPMENT

Turbines

2—1250 KVA. Westinghouse Horizontal Turbo Generating Units, wound for 3 phase, 60 cycles, 2200 volts. Each unit complete with 4500 sq. ft. Worthington surface condenser, circulating pump, rotary dry vacuum pump and wet vacuum pump. Designed for 150 lb. steam pressure. Turbines fitted with bronze blading.

25 Cycle Rotary Converters

2—150 KW. General Electric type T.C., 4-150-750, 25 cycle, 3 ph., 575 volt, rotary converters, 750 rpm., complete with end play and speed limit device.

200 Kilowatt 60 Cycle Rotary Converters

2—200 KW. Westinghouse 3 ph., 60 cy. rotary converters, 550 volts, 720 rpm., complete with 4—100 KW. Westinghouse Scott connected oil insulated transformers, 10,000/9500 volts prim., 430/362 volts secy.

Transformers

6—750 KVA. General Electric oil filled self cooled transformers, 4400/281 volts, with 4400-4290-4180-4070-2200-2090-1980 taps in the primary.
3—500 KW. General Electric, 60 cy., single phase transformers, 66,000 volts primary, 4400/2200 volts secondary.
3—350 KVA. General Electric, type H, 60 cy., transformers 2400/2300/2200 v. prim., 200/400 v. secy.
1—100 KVA. General Electric, type H, 60 cy. transformer, 4600 volts prim., 115-230 volts secy.
3—100 KW. Wagner single phase, 60 cycle, 6600 volts primary, 2050/2300 volts secy., complete with oil.
4—100 KW. Westinghouse, oil insulated, Scott connected transformers, 10,000/9500 v. primary, 430/362 v. secondary.
3—75 KW. Westinghouse 60 cy. transformers, 2200 v. prim., 110/220/440 v. secy.
3—50 KVA. General Electric type H, 60 cy. transformers, 900/1000/16000 v. prim. Y., 230/460 v. secy.
Also a stock of smaller sized transformers.

IMMEDIATE DELIVERY

ARCHER & BALDWIN
114-118 Liberty Street New York City
TELEPHONE 4337-4338 RECTOR

FOR SALE

Used Railway Power House Equipment, to be sold either all together or in part, consisting of—

3—Corliss Horizontal Cross Compound condensing engines, 30 x 60 x 60, 75 r.p.m., 150 lb., 3,000 h.p.

1—Corliss, ditto, 34 x 70 x 40—4,500 h.p.

4—Vertical Buckeye Engines, 6½x12—45 h.p.

20—PUMPS—Condenser, Circulating, Boiler-Feed, Air Compressor, etc.

16—B. & W. 400 h.p. Water Tube Boilers equipped with Mechanical Stokers—Acme.

2—Traveling Cranes—51 ft. span, 70,000 lbs.

3—Siemens & Halske 1500 K.W. 600 V. Generators, direct connected.

1—General Electric 1600 K.W. 600 V. Generator.

Apply to E. E. Kretschmer, Purchasing Agent

Northwestern
Elevated Railroad Company
72 West Adams Street, Chicago, Ill.

SEARCHLIGHT SECTION

COMPLETE ARMATURES FOR SALE
FOR ALL THE STANDARD
STREET RAILWAY MOTORS
GET OUR PRICE WE CAN SAVE YOU MONEY
America's Greatest Repair Works
CLEVELAND ARMATURE WORKS, Cleveland, O.

CARS FOR SALE
OPEN and CLOSED
MOTOR and TRAIL
Write for Price and Full Particulars to
ELECTRIC EQUIPMENT CO.
Commonwealth Bldg. Philadelphia, Pa.

Do You Want a Salesman or Other Assistant?

If so, send us copy for a card under "Positions Vacant" in the Searchlight Section. The cost will be slight and the result will be both quick and satisfactory.

Get your Wants into the Searchlight
Electric Railway Journal, 239 West 39th St., New York

WANT TO BUY
3900 ft. 2/0 grooved
New Trolley Wire
State delivery and best price for the lot.
S. M. Gallaher, Supt.
CHARLESTON INTERURBAN RAILROAD CO.,
Charleston, W. Va.

FOR SALE

4000 K. W. Generators—For Sale

Two four thousand kilowatt, 13200 volt, 25 cycle, 300 r.p.m., 3 phase, revolving field type, with shaft, base and bearings. Practically new. Can ship at once. Address H. U. Roeding & Co., Foxcroft Building, San Francisco.

FOR SALE
Relaying Rails
About 350 tons, 60 lbs. per yard, with splices, for prompt shipment. Wire us your inquiries.
LURIA BROS. & CO.
Woolworth Bldg. New York

FOR SALE
600 Flat Tie Rods
with ⅞" terminals and square nuts.
AUSTIN STREET RAILWAY CO.,
Austin, Texas.

NEW STEEL RAILS
For Immediate Shipment
225 tons 75 lb. with Heavy Splices
280 tons 85 lb. with Angles
1000 tons 90 lb. with Angles
Exceptional opportunity. Also large quantity other Section. *Write or Wire.*
ZELNICKER IN ST. LOUIS

Immediate Shipment
100 tons of 62 lb. Shanghai rails, together with bars, rails practically as good as new, ready for quick shipment. Wire for prices.
M. K. FRANK
Frick Building, Pittsburgh, Pa.

85 lb. A. S. C. E. Relayers
16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes.
Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.
L. B. FOSTER COMPANY
Park Bldg. Pittsburgh, Pa.

MISCELLANEOUS WANTS

Wanted at Once

For immediate shipment any quantity of battery lead plates, sediment scrap copper and wire, brass and all other grades of scrap material. Write to us today for our prices. National Metal & Rubber Co., 31 India Wharf, Boston, Mass.

POSITIONS WANTED

EXECUTIVE open for position as manager of public utility. Technical engineer. Good record and references. Box 1502, Elec. Ry. Journal.

GENERAL superintendent or superintendent of transportation, age 38, 19 years' experience holding responsible position, but desire a change. Box 1503, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

HIGH-grade man wants position as general assistant to high official in railway or manufacturing business. Thoroughly experienced in railway work and possessed of an excellent business training. Box 1480, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

SUPERINTENDENT, good experience and record on city and suburban property. Available now. Good references. Box 1505, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

YOUNG married man desires to take charge of accounting for street railway or lighting company. Can handle accounting for interstate road. References. Box 1486, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

POSITIONS VACANT

Wanted first class
ARMATURE WINDERS
for A.C. and D.C. motors
Give reference and salary expected in first letter. Address
The Cameron Electrical Mfg. Co.,
Ansonia, Conn.

POSITIONS VACANT

APPLICATIONS for positions as blacksmith, car carpenters, truck repairmen, motor repairmen, car electrician, armature winder, painters, pitmen wanted. No trouble. State age, qualifications, experience, salary wanted, references in first letter. A-1 men only need apply. Address Box 1484, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

MANAGER small street railway in the South. Must be a good all around street car man. State age, experience and salary in first letter. Box 1507, Elec. Ry. Journal, Real Estate Trust Bldg., Philadelphia, Pa.

TECHNICAL graduate as assistant in department having charge of schedules, 850 miles city and suburban lines, and special investigations. State experience in both and salary expected. Box 1509, Elec. Ry. Journal.

WANTED—Graduate engineer with electric railway maintenance of way experience. State age, experience, how soon available, and salary expected. Box 1501, Elec. Ry. Journal.

WANTED—Working car barn foreman—Must be familiar with types M and K control—all G. E. equipment; also must be familiar with the operation and maintenance of Westinghouse straight and automatic air equipment. An agreeable position with a coming concern for a man who can qualify. Tell it all in the first letter—whom you have been with, what you have been doing, salary required, and when services are available. Address "Tidewater," Box 1498, Elec. Ry. Journal.

AGENTS AND SALESMEN

Salesman Wants Position

Salesman—Electric railway supplies, desires change. Good references. Box 1510, Elec. Ry. Journal.

EMPLOYMENT AGENCIES

Correspondence Service

The undersigned provides a confidential service designed to locate openings through correspondence for men earning not less than $2,500 and up to $25,000; all lines. Not an employment agency, but a constructive, initiative service, covering individual negotiations. Established 1910. Complete privacy assured; present connections in no way jeopardized. Send name and address only for explanatory details. R. W. Bixby, H1 Niagara Square, Buffalo, N. Y.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

More than 300 different products are here listed. The Alphabetical Index (see eighth page following) gives the page number of each advertisement. As far as possible advertisements are so arranged that those relating to the same kind of equipment or apparatus will be found together.

This ready-reference index is up to date, changes being made each week. If you don't find listed in these pages any product of which you desire the name of the maker, write or wire Electric Railway Journal, and we will probably furnish the information.

Acetylene Apparatus. (See Cutting Apparatus, Oxy-Acetylene.)

Acetylene Service
Oxweld Acetylene Co.

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Horne Mfg. Co.

Alloys and Bearing Metals. (See Bearings and Bearing Metals.)

Alloys, Steel and Iron.
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Automobiles and Buses.
Brill Co., The J. G.

Axles.
National Tube Co.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The

Bankers and Brokers.
National City Co.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
More-Jones Brass & M. Co.
Post & Co., E. L
St. Louis Car Co.
Westinghouse Elec. & M. Co.

Bearings, Center.
Baldwin Locomotive Works.
Holden & White, Inc.

Bearings, Oilless, Graphite, Bronze and Wood.
Bound Brook Oil-less B. Co.

Bearings, Roller and Ball.
Gurney Ball Bearing Co.
Railway Roller Bearing Co.

Bearings, Roller Side.
Holden & White, Inc.
Stucki Co., A.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Zelnicker Sup. Co., W. A.

Blow Torches for Soldering and Brazing. (See Cutting Apparatus, Oxy-Acetylene.)

Blowers.
General Electric Co.
Westinghouse Elec. & M. Co.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Dearborn Chemical Co.

Boiler Tubes.
National Tube Co.

Bond Clips.
Electric Railway Improvement Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improvement Co.
Ohio Brass Co.
Oxweld Acetylene Co.

Bonding Tools.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Bonds, Welded.
Lincoln Bonding Co.

Book Publishers.
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Etc.)
Bates Expanded Steel Truss Co.
Electric Ry. Equipment Co.
Electric Service Supplies Co.
Hubbard & Co.
Int'l Creosoting & Constr. Co.
Lindsley Bros. Co.
Ohio Brass Co.

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Holden & White, Inc.
Smith-Ward Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdy. Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Long Co., E. G.
St. Louis Car Co.

Brakes, Brake Systems and Brake Parts.
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Westinghouse Trac. B. Co.

Brooms, Track, Steel or Rattan.
Zelnicker Supply Co., W. A.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.

Brushes, Carbon.
American Carbon & Battery Co.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
Dixon Crucible Co., Jos.

Bumpers, Car Seat.
Electric Service Supplies Co.

Bushings, Case Hardened and Manganese.
Bemis Car Truck Co.

Bushings, Fibre.
Diamond State Fibre Co.

Bushings, Graphite and Wooden.
Bound Brook Oil-less B. Co.

Buttons. (See Badges and Buttons.)

Cables. (See Wires and Cables.)

Calculating Machines.
Monroe Calculating Mach. Co.

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc. —See those headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Jewett Car Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Stephenson Co., John.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co.
Kerschner Co., Inc., W. R.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Car Stops, Automatic.
Consolidated Car-Heating Co.

Castings, Brass.
Columbia M. W. & M. I. Co.
Eureka Co.
Frankel Connector Co.
More-Jones Brass & M. Co.

Castings, Composition or Copper.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.

Castings, Gray Iron and Steel.
Amer. Brake Shoe & Fdy. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
Amer. Brake Shoe & Fdy. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Eclipse Railway Supply Co.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
Ohio Brass Co.
Union Electric Co.
Wood Co., Chas. N.

Ceiling, Car.—(See head lining.)

Charging Sets, Storage Battery.
General Electric Co.

Chemists.
Little, Inc., Arthur D.

Circuit Breakers.
Cutter Electrical & Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
Frankel Connector Co.
General Electric Co.
Hubbard & Co.
Klein & Sons, Mathias.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Cleaners and Scrapers, Track.—(See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.

Cleats, Car Wiring.
General Electric Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling.—(See Conveying and Hoisting Machinery.)

Coasting Clocks.
Railway Improvement Co.

Coil Banding and Welding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Coils, Armature & Field.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Model 341
A.C. and D.C. Voltmeter

One of the Portable Electrodynamometer Group, which also includes Model 310 Single Phase and D. C. Wattmeter, Model 329 Polyphase Wattmeter, and Model 370 A. C. and D. C. Ammeter.
The characteristics of the group are extreme accuracy (guaranteed within a fraction of 1% full scale value), adaptability for use on circuits of any commercial frequency and any wave form, great overload capacity, low moment of inertia, effective damping and shielding, and the legibility and remarkable uniformity of the hand calibrated scales.

Service—
The Supreme Aim

It is our conviction that the success of an industrial or commercial organization—as of a man—can be measured only by the value of its service to mankind.

Weston

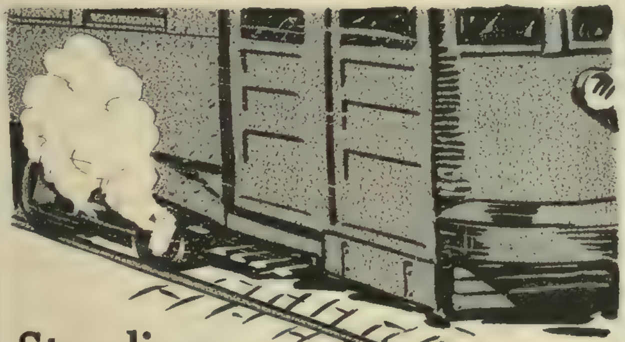
Indicating Instruments

have played a leading, often an indispensable, part in the advances made since 1888 in every field of electrical achievement. Today, as at every previous stage of their steady progress toward perfection, they stand alone as the highest attainment in the Art of Electrical Measurement.

Weston Indicating Instruments include a great variety of groups for portable or switchboard service on A. C. or D. C. Circuits, Instruments designed expressly for testing and laboratory use, for motor car and boat electrical systems, and many others for special purposes. Write for Bulletins or Catalogs describing those which interest you.

Weston Electrical Instrument Company
21 Weston Ave., Newark, N. J.

New York
Philadelphia
Pittsburgh
Cleveland
Cincinnati
Chicago
Boston
Buffalo
Richmond
San Francisco
Denver
Detroit
St. Louis
Toronto
Winnipeg
Montreal
Vancouver
London
Paris
Petrograd
Florence
Johannesburg, S. Africa



Standing the Overload

What's the usual result of an overload on your car motors or compressors?

A puff of smoke—followed by a trip to the repair shop. You can eliminate these trips by using

Salamander
Fireproof Wire

motor field, armature and compressor coils. You can't burn out Salamander Wire Coils. We've had them red-hot on test without any breakdown.

Send for samples and catalogs.

Independent Lamp & Wire Co., Inc.
Offices: 1737 Broadway, New York
FACTORIES: York, Pa., and Weehawken, N. J.

National Railway Appliance Company

50 East 42d St., NEW YORK CITY
Chicago Washington, D. C.

RAILWAY SUPPLIES

SELLING AGENTS FOR

Tool Steel Gears and Pinions
Johnson Fare Box
Perry Side Bearings
Hartman Centering Center Plates
Wasson Trolley Bases
Garland Ventilator
Electric Arc Welders
High Class Railway Varnishes and Enamels
Elastic Car Waste

Special Agents for
- Tool Steel Gear & Pinion Co.
- Johnson Fare Box Co.
- C. & C. Electric & Mfg. Co.
- Holden & White

General Agents for Anglo-American Varnish Co.
Eastern Agents for Union Fibre Co.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
International Register Co., The.
Johnson Fare Box Co.

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices.
General Electric Co.
Jordan Bros., Inc.

Commutators or Parts.
Cameron Elec'l Mfg. Co.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Long Co., E. G.
Westinghouse Elec. & M. Co.

Compressors, Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Trac. B. Co.

Condensers.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Connectors, Solderless.
Frankel Connector Co.
Horne Mfg. Co.

Controller Fingers.
Horne Mfg. Co.

Controller Regulators.
Electric Service Supplies Co.

Controllers or Parts.
Allis-Chalmers Mfg. Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Westinghouse Elec. & M. Co.

Controlling Systems.
General Electric Co.
Westinghouse Elec. & M. Co.

Converters, Rotary.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Conveying and Hoisting Machinery.
Columbia M. W. & M. I. Co.
Green Engrg. Co.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The.
Long Co., E. G.
Roebling's Sons Co., John A.
Samson Cordage Works.

Cord Connectors and Couplers.
Electric Service Supplies Co.
Samson Cordage Works.
Wood Co., Chas. N.

Couplers, Car.
Brill Co., The J. G.
Long Co., E. G.
Ohio Brass Co.
Van Dorn Coupler Co.
Westinghouse Trac. B. Co.

Couplings, Conduit.
Horne Mfg. Co.

Cranes. (See also Hoists.)
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.

Creosoting. (See Wood Preservatives.)

Cross Arms. (See Brackets.)

Crossing Foundations.
International Steel Tie Co.

Crossing Signals. (See Signals, Crossing.)

Crossings, Track. (See Track, Special Work.)

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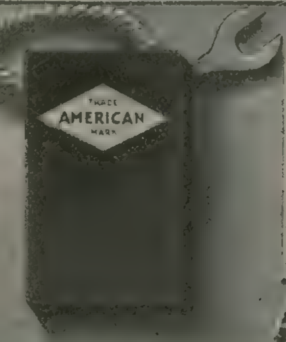

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Brill Co., The J. G.

Voltmeters. (See Instruments.)

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Anderson Mfg. Co., A. & J. M.
Bound Brook Oil-less B. Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Eureka Co.
General Electric Co.
Holden & White, Inc.
Long Co., E. G.
More-Jones Brass & M. Co.
Nuttall Co., R. D.
Star Brass Works.

Whistles, Air.
General Electric Co.
Ohio Brass Co.

Winding Machines. (See Coil Banding and Winding Machines.)

Window Operators.
Drouvé Co., The G.

Wire Rope.
American Steel & Wire Co.
Roebling's Sons Co., John A.

Wires and Cables.
Aluminum Co. of America.
American Steel & Wire Co.
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Standard Underground Cable Co.
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It's true that *prescribed* Morganite brushes are not spectacular like the firefly variety

—but then they are sold for commutation—not illumination.

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Printing begins on Tuesday of each week.

Changes of copy received up to 10 A. M. Monday will appear in the issue of the following week, but no proofs can be submitted for OK before publication.

New Advertisements (not changes of copy) received up to Wednesday noon can appear in the issue of that week, but no proofs can be shown.

If proofs before printing are required, change of copy and copy for new advertisements must be in our hands 10 days in advance of the date of publication.

A

Page

Ajax Metal Co. 47
Allis-Chalmers Mfg. Co. 33
Aluminum Co. of America 40
Amer. Brake Shoe & Fdry. Co. 57
American Car Co. 61
American Carbon & Battery Co. 55
American Mason S. T. Co. 47
American Steel & Wire Co. 41
Anderson Mfg. Co., A. & J. M. 31
Archbold-Brady Co. 40
Archer & Baldwin 48
Arnold Co., The 30

B

Babcock & Wilcox Co. 42
Baldwin Locomotive Works, The 47
Bates Expanded Steel Truss Co. 39
Bemis Car Truck Co. 55
Bonham Recorder Co. 45
Bonney-Vehslage Tool Co. 44
Bound Brook Oil-less Bearing Co. 46
Bridgeport Brass Co. 10
Brill Co., The J. G. 61
Buckeye Jack Mfg. Co. 44
Byllesby & Co., H. M. 30

C

Cameron Elec'l Mfg. Co. 44
Canton Culvert & Silo Co. 41
Carnegie Steel Co. 47
Carney & Co., B. J. 40
Chipman Chemical Engrg. Co. 33
Cleveland Armature Works 49
Cleveland Fare Box Co. 45
Cleveland Frog & Crossing Co. 41
Collier, Inc., Barron G. 26
Columbia M. W. & M. I. Co. 24
Consolidated Car Fender Co. 46
Consolidated Car-Heating Co. 45
Cooper Heater Co., The 45
Crouse-Hinds Co. 17
Cutter Co. 42

D

D & W Fuse Co. 43
Daum, A. F. 36
Dayton Fare Recorder Co. 20
Dearborn Chemical Co. 42
Diamond State Fibre Co. 40
Dixon Crucible Co., Joseph 41
Dolph Co., John C. 34
Drew Elec. & Mfg. Co. 32
Drouvé Co., The G. 35
Drum & Co., A. L. 30
Duff Manufacturing Co., The 43

E

Eclipse Ry. Supply Co. 47
Economy Fuse & Mfg. Co. 37

Page

Electric Equipment Co. 49
Electric Railway Equipment Co. 8
Electric Railway Improve. Co. 16
Electric Service Supplies Co. 11
Electric Storage Battery Co. 55
Elec'l Testing Laboratories 30
Eureka Co. 43

F

Federal Signal Co. 39
Ford, Bacon & Davis 30
Ford Chain Block & Mfg. Co. 43
"For Sale" Ads 48, 49
Frankel Connector Co. 39

G

Galena-Signal Oil Co. 22
General Electric Co. 28, Back Cover
Globe Ventilator Co. 46
Gold Car Heating & Lighting Co. 45
Goldschmidt Thermit Co. 15
Green Eng'g Co. 41
Gurney Ball Bearing Co. 60

H

Hale & Kilburn Co. 45
Hartshorn Co., Stewart 44
"Help Wanted" Ads 48, 49
Holden & White, Inc. 46
Horne Mfg. Co. 55
Hubbard & Co. 40
Hunt & Co., Robert W. 30

I

Independent Lamp & Wire Co. 51
Ingersoll-Rand Co. 53
International Creo. & Con. Co. 40
International Register Co., The 19
International Steel Tie Co., The 9

J

Jackson, D. C. & Wm. B. 30
Jeandron, W. J. 53
Jewett Car Co. 38
Johnson Fare Box Co. 18
Jordan Bros. Inc. 44

K

Kerschner Co., Inc., W. R. 48
Kilby Frog & Switch Co. 41
Kinnear Mfg. Co. 43
Klein & Sons, Mathias 40
Kuhlman Car Co., G. C. 61

L

Page

Lackawanna Steel Co. 13
Lincoln Bonding Co. 31
Lindsley Bros. Co. 40
Little, Inc., Arthur D. 30
Long Co., E. G. 55

M

McCardell & Co., J. R. 40
McGraw-Hill Book Co., Inc. 21
MacGovern & Co., Inc. 48
Mechanical Rubber Co. 32
Miller Trolley Shoe Co. 23
Monroe Calculating Machine Co. 35
More-Jones Brass & Metal Co. 34
Morgan Crucible Co. 57
Murphy Iron Works 42

N

Nachod Signal Co. 39
National Brake Co. 29
National City Co. 30
National Railway Appliance Co. 51
National Tube Co. 40
Nelsonville Brick Co. 41
New York Switch & Cross. Co. 41
Niles-Bement-Pond Co. 36
Northwestern Elev. R. R. Co. 48
Nuttall Co., R. D. 46

O

Ohio Brass Co. 6, 7
Oxweld Acetylene Co. 43

P

Packard Electric Co. 43
Page Woven Wire Fence Co. 40
Pantasote Co., The 45
Perey Mfg. Co., Inc. 46
"Positions Wanted" Ads 49
Post & Co., Inc., E. L. 47
Power Specialty Co. 42
Protective Materials Corp. 14

R

Railway Improvement Co. 27
Railway Roller Bearing Co. 55
Railway Track-work Co. 12
Railway Utility Co. 46
Ramapo Iron Works 39
Richey, Albert S. 30

Page

Roebling's Sons Co., John A. 40
Roller Lock Nut Co. 37
Rooke Automatic Register Co. 45

S

St. Louis Car Company, The 57
Samson Cordage Works 53
Sanderson & Porter 30
Sangamo Electric Co. Front Cover
Scofield Engineering Co. 30
Searchlight Section 48, 49
Second Hand Equip. 48, 49
Sherwin-Williams Co. 43
Simmen Automatic Railway Signal Co. 39
Smith Heater Co., Peter 45
Smith-Ward Brake Co. 53
Standard Paint Co. 44
Standard Steel Works Co. 38
Standard Underground Cable Co. 40
Standard Varnish Works 44
Standard Woven Fabric Co. 43
Star Brass Works 46
Stephenson Co., John 61
Stone & Webster Eng'g Corp. 30
Stucki Co., A. 47

T

Titanium Alloy Mfg. Co. 59
Tool Steel Gear & Pinion Co. 25

U

Union Spring & Mfg. Co. 55
Universal Lubricating Co., The 53
Universal Safety Tread Co. 47

V

Van Dorn Coupler Co. 47

W

"Want" Ads 49
Wason Mfg. Co. 61
Westinghouse Elec. & Mfg. Co. 2, 5
Westinghouse Traction Brake Co. 4
Weston Elec'l Instrument Co. 51
White Companies, The J. G. 30
Wisch Service, The P. Edw. 30
Wood Co., Chas. N. 39
Woodmansee & Davidson, Inc. 30

Z

Zelnicker Supply Co., Walter A. 49

Titanium-Treated Rails in use at Fall River Mass.

TITANIUM-TREATED RAIL
in the Bay State

—on the lines of the Bay State Street Railway—have been for some time installed in Fall River and in Methuen, Mass.

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Though these rails cost a little more per ton than ordinary untreated carbon rails, actual service in a wide variety of installations all over the country proves them to have about 40% longer life.

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Chicago, Ill. **New York City**

BRILL

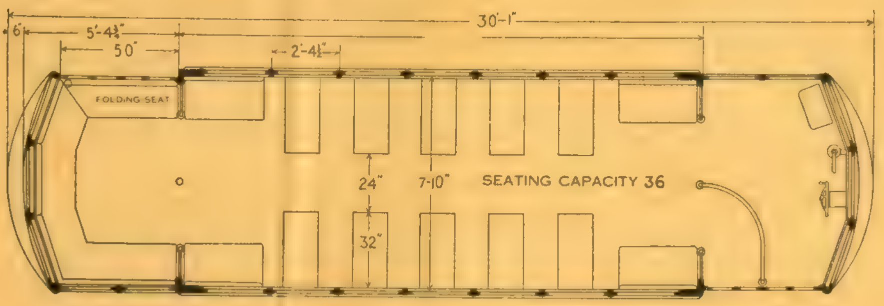
BRILL-BUILT LIGHT-WEIGHT ONE-MAN CARS

In the April issue of Brill Magazine there appeared an article on "Single-End Cars for Union Depot Bridge & Terminal Company of Kansas City," of which the floorplan, shown below, was one of the illustrations.

These cars, which by the way are "Safety Cars," are given an extra large seating capacity by utilizing the rear platform (the platforms are flush with the car floor) for seating space. This arrangement provides ample standing space and has the merit of having the rear emergency door where it can be used for entrance should the cars ever be called on for double-end operation.

The name "Safety Car" is derived from the Birney combination of emergency devices which are particularly applicable to one-man cars. By simply releasing his hold on the controller handle the motorman instantly cuts off the power, puts on the brakes, starts the sand, opens the front door and unlocks the rear door. Thus an involuntary movement of the motorman on a "Safety Car" in case of emergency is better than quick-witted action on an ordinary car.

Be sure to read the article referred to and send for Bulletin 223.



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Some Way Department Problems

ELECTRIC RAILWAY JOURNAL

New York, May 26, 1917 McGraw-Hill Publishing Co., Inc. Vol. 49, No. 21 10c a copy

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The Quick-Service Safety Car

"JOE," said the General Manager to the Superintendent, "I have gone over your report on the economies we could secure with these light-weight, 'Quick-Service Safety Cars,' and I have also received letters from my friends who have tried them out. It is astonishing how successful they have been. The Westinghouse engineers did another big thing for the industry when they developed the original 'WEE' motors for this light-weight service."

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"I didn't mention it before," said the General Manager, "but a number of the men I wrote to, said the Westinghouse No. 506 Motor on their 'Quick-Service Safety Cars' was performing the work splendidly."

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Sales Offices in All
Large American Cities

East Pittsburgh
Pennsylvania

ELECTRIC RAILWAY JOURNAL

VOLUME XLIX, No. 21 NEW YORK, MAY 26, 1917 PAGES 945 TO 988

CONTENTS

Double Guards Reduce Cost

William H. Stevenson, engineer Philadelphia (Pa.) Holding Company, tells how guards on the outer rails of curves increase the life of rolling stock and effect a considerable reduction in maintenance cost..Page 948

Inexpensive Way of Cutting Construction Costs

Frank B. Walker shows how co-operation among departments tends to eliminate waste. He gives a practical plan by the employment of which such co-operation can be assured.............................Page 950

Commissions Know Costs Are High

A canvass by banking house shows that public service commissions appreciate the present operating conditions. Regulatory bodies rather anticipate that formal application will be made for relief.......Page 953

EQUIPMENT AND ITS MAINTENANCE......965
Steel Tower Moved in Thirty Minutes—*By E. B. Hook, Jr.*
The "Swing-Frame" Grinder—*By R. C. Cram.*
Change in Lubricating Methods Effects a Big Economy —*By F. H. Hill.*
Flexible-Base Jacks in Pole Handling.
Notes on Small Tool Practices in International Railway Shops.
Fiber Gear Cut by Device Rigged Up on Lathe—*By G. B. Sisson.*
Use of Welder and Old Joint Plates Effects Big Saving at Fort Worth.
Cost of Erecting Overhead Work—IX.
Spring Chuck for Taking Up Wear in Controller Handles.
Heater Motor Maintenance Cost Reduced.
Meter for Measuring Line Loss.

EDITORIALS 945
Solicit Freight to Relieve Steam Roads.
Government and Business.
Add Automobile Merits to Railway Service.
Taxation to Increase Platform Wages.
Fare Increases Need Not Wait on Valuations.
Get Car Men Interested in the Power Plant.
Time for United Action.

SOLVING THE GRADE CROSSING PROBLEM...952

HOME-MADE TRAFFIC SIGN AT WORCESTER, MASS. 952

AN IMPROVISED ELECTRIC LOCOMOTIVE....954

ELECTRIC RAILWAYS MUST HAVE GREATER REVENUE 955

WHAT THE CALIFORNIA ASSOCIATION HAS DONE 956

NEW YORK CITY LINES ASK TWO-CENT TRANSFERS 957

FLOATING THE LIBERTY LOAN............959

AMERICAN ASSOCIATION NEWS..........961

NEW TRANSFER DEVELOPED AT LOS ANGELES 963

ARKANSAS ASSOCIATION MEETS..........963

COMMUNICATIONS 964
"Killing" the Trolley Wire Near Open Drawbridges.
Speeding Service by Educating Public.
Equalizer Bars Not Necessary for Either Easy Riding or Safety.

NEWS OF ELECTRIC RAILWAYS...........971
Hearing on Philadelphia Bills.
Apparent Deadlock in Providence.
Washington Strike Inquiry.
St. Paul to Rush Electrification.
Hydroelectric Power Helpful.
Seattle Bridge Negotiations Continue.
Atlanta Fire Damage.
Seattle Settlement Terms Filed.

FINANCIAL AND CORPORATE.............975
Electric Railway Statistics.
R., S. & E. Reorganization Plan.

TRAFFIC AND TRANSPORTATION..........979
Seattle Restricts Use of One-Man Cars.
Free-Ride Order in Indiana Opposed.
Mr. Brush Suggests Transfer Areas.
Bonding Company for Washington Jitneys.
I. C. C. Dismisses Transfer Case.
Pacific Electric Men Send Out Letter.
Inter-Company Service Authorized.

PERSONAL MENTION 982

CONSTRUCTION NEWS 983

MANUFACTURES AND MARKETS...........985

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FROM
THE PRESIDENT'S PROCLAMATION
April 15, 1917

"TO the men who run the railways ot the country, whether they be managers or operative employes, let me say that the railways are the arteries of the nation's life, and that upon them rests the immense responsibility of seeing to it that those arteries suffer no obstruction of any kind, no inefficiency or slackened power.

"To the merchant let me suggest the motto, 'Small profits and quick service'; and to the shipbuilder the thought that the life of the war depends upon him. The food and the war supplies must be carried across the seas no matter how many ships are sent to the bottom. The places of those that go down must be supplied and supplied at once.

"To the miner let me say that he stands where the farmer does. The work of the world waits on him. If he slackens or fails, armies and statesmen are helpless. He also is enlisted in the great service army.

"The manufacturer does not need to be told, I hope, that the nation looks to him to speed and perfect every process; and I want only to remind his employes that their service is absolutely indispensable and is counted on by every man who loves the country and its liberties.

"It is evident to every thinking man that our industry on the farms, in the shipyards, in the mines, in the factories, must be made more prolific and more efficient than ever, and that they must be more economically managed and better adapted to the particular requirements of our task than they have been; and what I want to say is that the men and the women who devote their thought and their energy to these things will be serving the country and conducting the fight for peace and freedom just as truly and just as effectively as the men on the battlefield or in the trenches.

"This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and every woman assume the duty of careful, provident use and expenditures as a public duty, as a dictate of patriotism which no one can now expect ever to be excused or forgiven for ignoring."

Air Brakes control the Railroad Traffic Movement of the Nation. In the Crisis now confronting us, we shall co-operate even more earnestly than in the past to the end of the most efficient railway operation possible. Suggested by the Westinghouse Air Brake Company.

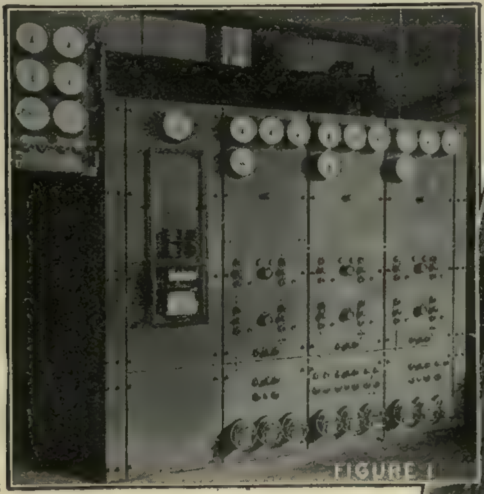
Westinghouse

Switchboards and Switch Gear

Buffalo General Electric Co.'s
New, River Steam Station

66,666 Kva.
(Initial)

233,000 Kva.
(Ultimate)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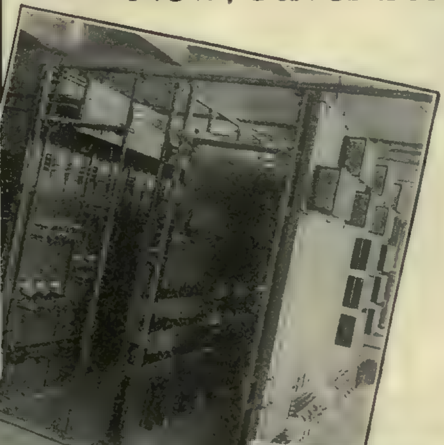
FIGURE 2

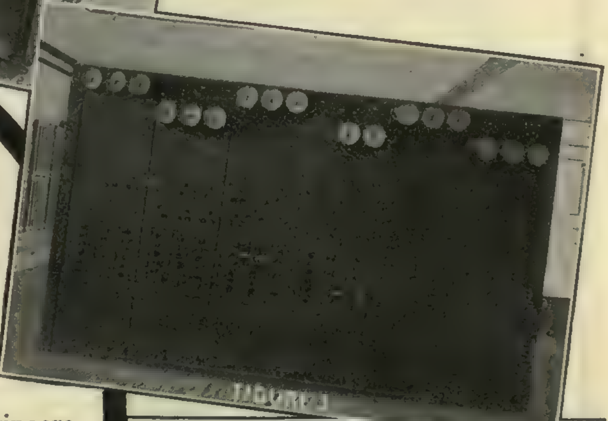
FIGURE 3

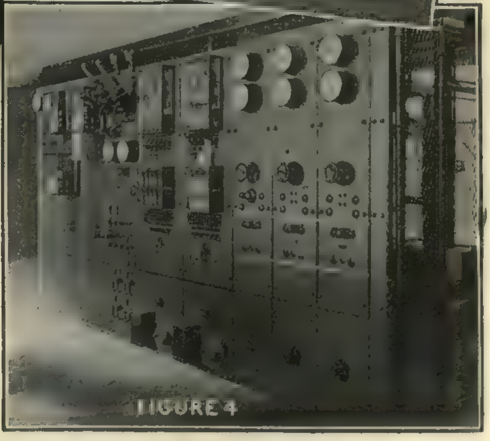
FIGURE 4

Figure 1 illustrates the main generator control board; Figure 2 its relay and watthour meter panels to rear; Figure 3 the alternating current feeder board, and Figure 4 the exciter, voltage regulator and direct-current local service board.

With these, for initial 66,666 kva. generating capacity, as part of the main switch gear (all Westinghouse) for this immense station, were included twelve 2,000 ampere Type 0-2 and seventeen 600 amperes Type 0-1 Oil Circuit Breakers.

The satisfaction given by this Westinghouse Switchboard Equipment, to both customer and consulting engineers (Stone & Webster Engineering Corporation) is evidenced by a contract just placed for additional Westinghouse Switchboard Equipment to control a new and additional 38,000 kva. generator. Included are three 3,000 ampere Type O-2 and six 600 ampere Type O-1 Oil Circuit Breakers.

This is further evidence of Westinghouse Switchboard Quality.

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East Pittsburgh, Pa.

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*W. E. & M. Co. of Texas

O-B Type E Frog—Patented

A Frog for Universal Application

O-B Type E Frog is particularly suitable for high speed service.

Long legs, smooth approach, tongues gradually tapered into pan, abundant clearance for wide harps, carefully designed pan—all these things make it easy for the wheel to take the right course even at high speed.

For the same reason the Type E works well in the city, where different types of cars are used with relative positions of trucks, base and wheel varying.

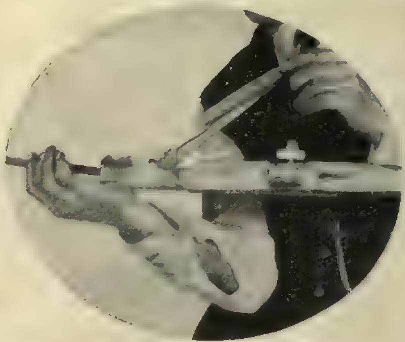
But wherever it is used its O-B Cam Tips speed up installation. At the left are illustrations which show how easily they are put on. Then, once on, they form a smooth, gradual transition from wire to frog, which reduces arcing to the minimum.

Made of tough O-B Bronze, they last for a long time even under severe service. They are quickly, easily, cheaply renewed.

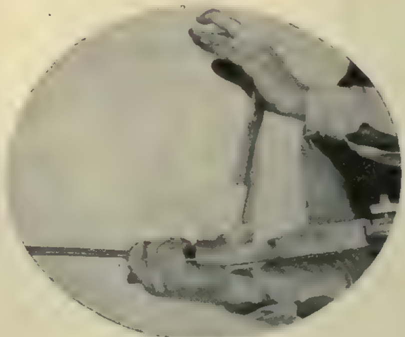
Delays to traffic are lessened by time-saving O-B Cam Tips. Used on O-B Cross-Overs, Frogs, Section Insulators, Strain Plates. Catalog No. 16.

The Ohio Brass Co.

Mansfield, Ohio

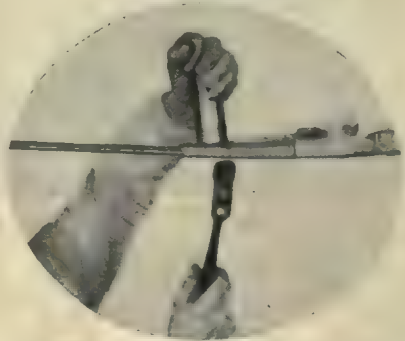


Slip tip under hooks—

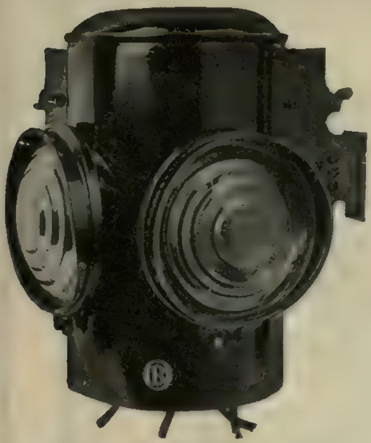


turn over and—

down on the wire—



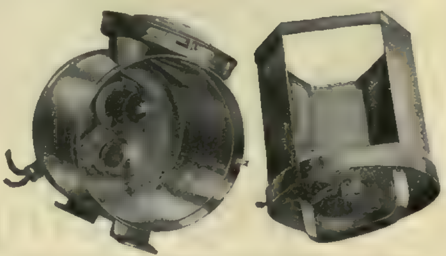
clinch the lips and the job is done



Automatic Double Lens Lantern

Duplex Tri-Colored Signal Lantern

Increased Safety with Decreased Expense



Interior Construction Tri-Color Lantern

There's a double benefit follows when the O-B Electric Car Signal System replaces oil signals.

Safety is of first importance.

O-B Signals cannot blow out or jar out. If the trolley current fails or if the regular circuit is broken for any reason a storage battery is cut in automatically and lights an auxiliary set of lamps in the regular lanterns. This battery is kept charged continually from the trolley.

Economy is another advantage of the O-B system over oil.

Carefully and conservatively compiled figures prove conclusively that there is a real and substantial saving in maintenance.

But send for the illustrated booklet which tells all the story.

The Ohio Brass Co.

Mansfield, Ohio

Replacing Twelve Million Car Cards Each Year

COLLIER SERVICE covers so many cars that approximately TWELVE MILLION cards are taken out and replaced every year.

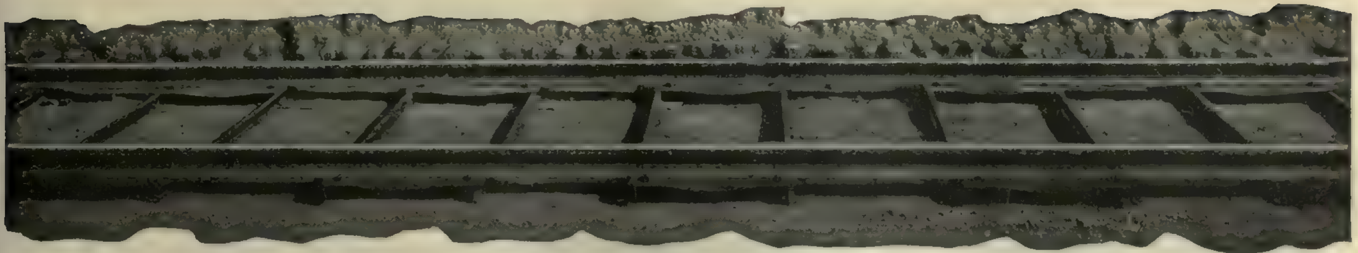
To accomplish this requires the attention of several hundred employes and necessitates an expenditure of more than One Hundred Thousand Dollars annually.

Consider also what an array of statistics COLLIER SERVICE must maintain at both home and branch offices to assure the display of the correct card at the proper time for thousands of advertisers in tens of thousands of cars throughout the country.

COLLIER SERVICE through the proper co-ordination of its various departmental divisions secures the best results to the advertisers and therefore assures dependable returns to the railway company.

Barron G. Collier
INCORPORATED

Candler Building
220 West 42nd Street, New York City

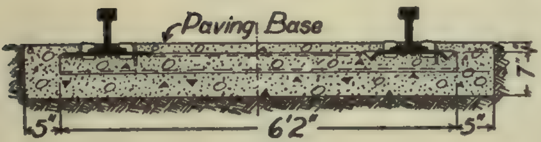


INTERNATIONAL

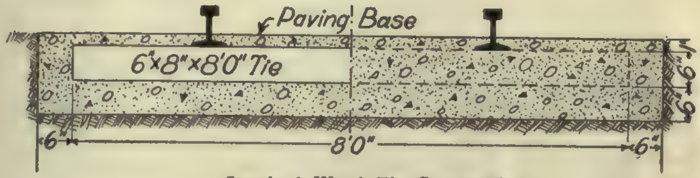
STEEL TWIN TIES

Save 33% to 60% in Labor

Here are two standard track sections



International Steel Tie Construction



Standard Wood Tie Construction

Note that International Ties require an excavation 7 feet wide and 14 inches deep and that wood tie construction requires an excavation 9 feet wide and 19 inches deep.

There's a saving of 40% in favor of International Ties.

Per mile of track there are required but 1/3 as many International twin tie as wood ties—to do the same work. Two men place and block up an International Tie as easily as a wood tie.

Another saving of 66% in favor of International Ties.

Eight malleable clips wedged into the plate holes are required to fasten an International Tie with a big factor of safety. To fasten rails to three wood ties requires 12 driven spikes.

Still another saving of at least 50% in favor of International Steel Ties.

Labor in these days of uncertainty and high prices is a mighty grave problem for the man who builds track.

Cut that problem in half by using International Steel Twin Ties.

Let us submit a comparative estimate for your job.

Prompt deliveries made from stock.

The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co., Los Angeles, Cal.
San Francisco, Cal. Seattle, Wash.
R. J. Cooper Co., Salt Lake City, Utah.
J. E. Lewis & Co., Dallas, Texas.
Maurice Joy, Philadelphia.
William H. Ziegler, Minneapolis, Minn.

Sixth
Street,
Philadelphia

Phono-Electric

The Lineman's Favorite

"Why don't you say something about the true gage of Phono-Electric Trolley Wire when you advertise it?" suggested one line superintendent recently.

"Of course, we install Phono-Electric mainly to get long wear, but it's no small satisfaction to find that it is always drawn so accurately to gage.

"Seldom does a Phono-Electric wire show any roughness or inequality.

"The linemen like a wire that is so easy-fitting and that won't be injured by accidental nicking."

BRIDGEPORT BRASS CO.
BRIDGEPORT CONNECTICUT

"Golden Glow"

Takes Active Part in Flag Raisings

At Des Moines

At Philadelphia

At Des Moines several hundred employees of the Des Moines City Railway enjoyed a flag raising ceremony at the Fourth Street shops of this Company. Des Moines is a "Golden Glow" city. Every car there is equipped with a "Golden Glow" headlight. And now these men have found another use for "Golden Glow"—to illuminate their new flag—and here is what they say—

"O SAY CAN YOU SEE
BY THE GOLDEN GLOW'S BRIGHT YELLOW GLARE
THAT OLD GLORY IS STILL THERE?
MAY IT PROTECT IT FROM AFAR
AS WELL AS IT PROTECTS THE CAR."

At Philadelphia most of the several hundred employees of the Electric Service Supplies Co. enacted a fitting ceremony as "Old Glory" was unfurled to the winds.

The flag is illuminated each night by two powerful "Golden Glow" flood-lighting projectors.

ELECTRIC SERVICE SUPPLIES CO.

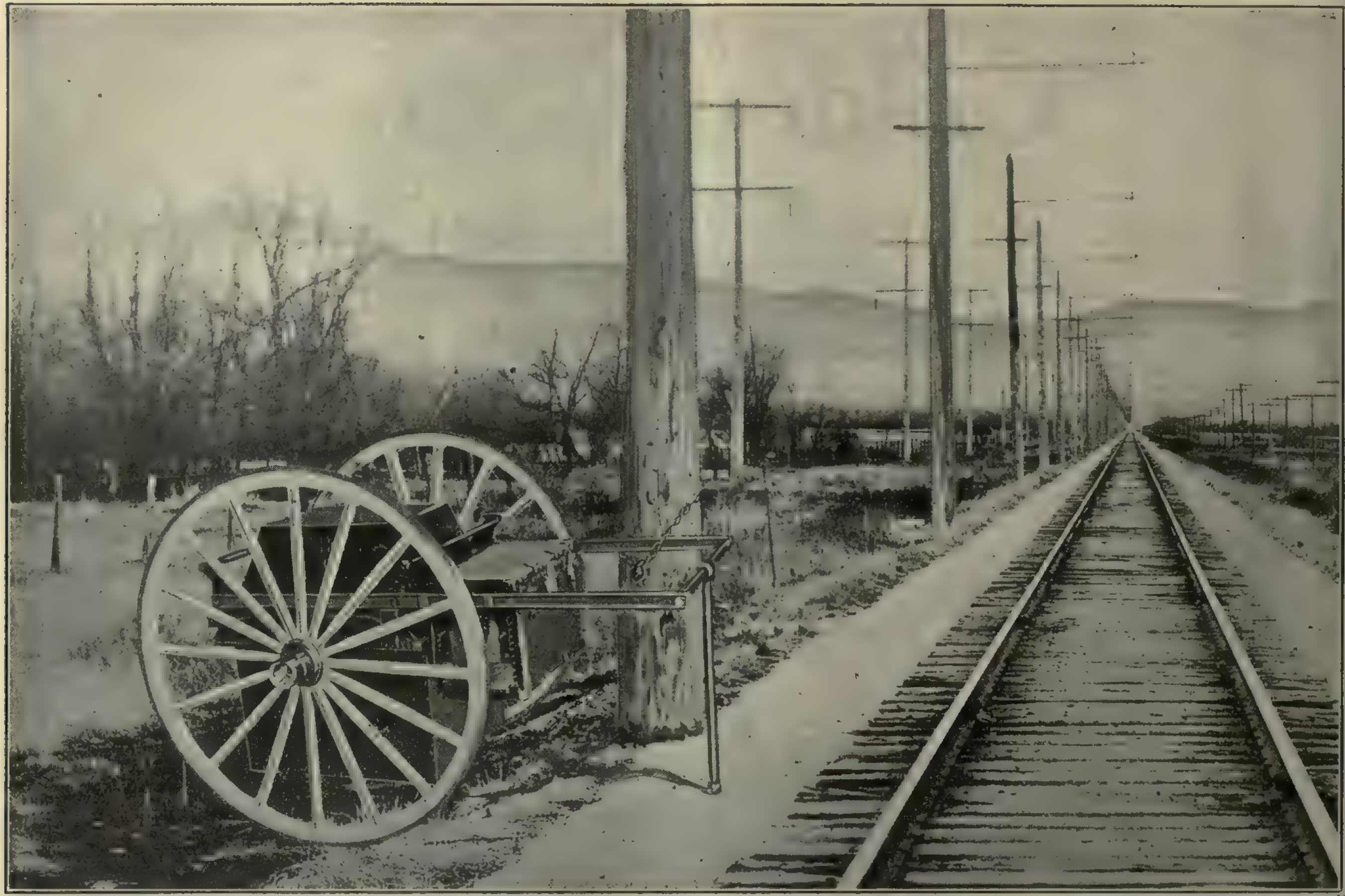
Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto



PORTABILITY and QUICK OPERATION

Two features most necessary in a rail-bonding machine are embodied in the new

LINCOLN BONDING CART

The bonding machine is entirely enclosed in a dust-proof, weather-resisting case and can easily be tied to a line pole and left on the road for the next day's work.

The electric arc obviates any joint cleaning by burning-off scale, rust, etc., and leaves a clean welding surface. The action of the arc makes steel rail and copper bond mingle in a perfect weld—and the operation is so rapid that the crystalline structure of the rail remains unharmed. Machines furnished with either car or carriage wheels.

The Lincoln Bonding Co.

636 Huron Road, Cleveland, Ohio

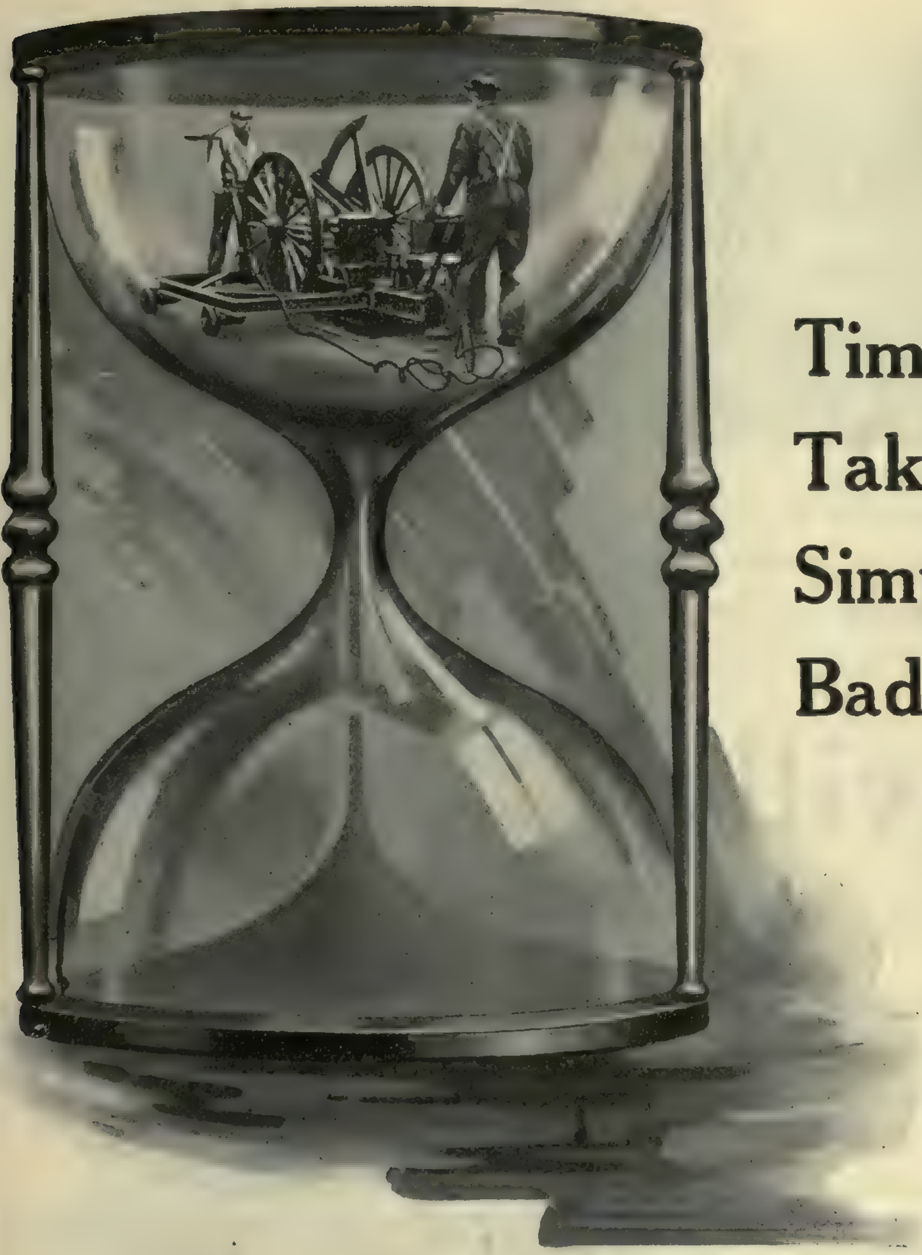
AGENTS:

LEWIS & ROTH COMPANY
1012 Liberty Bldg., Philadelphia, Pa.
114 Liberty St., New York City, N. Y.

CHARLES N. WOOD COMPANY
14 Federal St., Boston, Mass.

HOLDEN & WHITE, Inc., Chicago
343 S. Dearborn St.

W. C. BURDICK, Milwaukee, Wis.
808 First National Bank Building



Time Lost in Taking Action Simply Makes Bad Rails Worse

When "cupped joints" or "corrugations" *begin* to show in your rails is the time to get action. You don't save money by delay—you waste money. When these bad rail conditions appear put the

Reciprocating Track Grinder

at work immediately. Prompt treatment will save a lot of grinding that would otherwise have to be done and will also save a lot of the wearing surface of the rail. Scores of electric railways have found the Reciprocating Track Grinder an efficient money-saver in every way.

You can demonstrate that fact on your own tracks at our risk.

Railway Track-work Company

30th and Walnut Sts., Philadelphia, U. S. A.

Don't Kick at "Kick-ups"

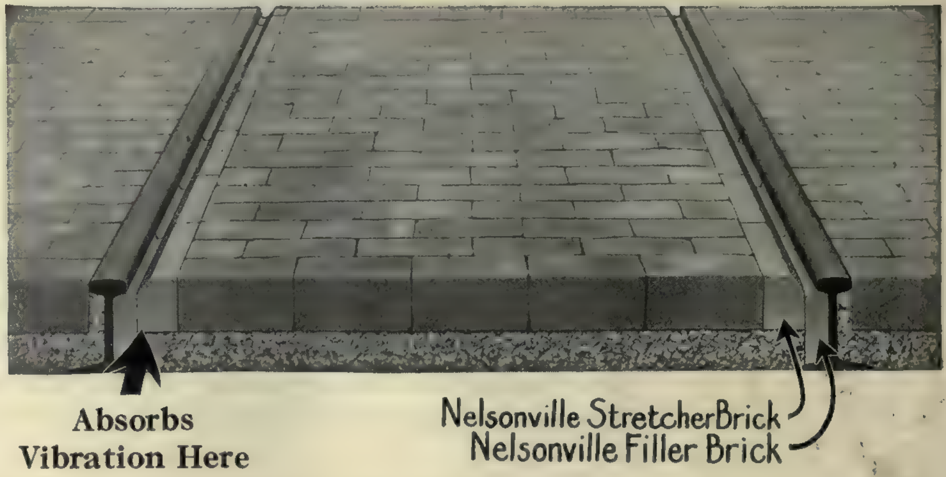
You don't have to have them—and you don't have to install expensive girder rail, either, to rid your track of paving-troubles. There IS an efficient way out of the difficulty—it's

Nelsonville Filler and Stretcher Brick

No amount of vibration will cause Nelsonville Brick to "kick-up" because there's a shock absorber feature in the "ungrouted" filler and stretcher brick that makes a permanently

Tight and Smooth Pavement

Let us send you
a copy of
"Rail Brick of the Right Sort."



THE NELSONVILLE BRICK CO.

Nelsonville, Ohio

ARMCO AMERICAN INGOT IRON CULVERTS

are making good in Oklahoma, too

Here's a 20 foot by 18 inch Armco Culvert under a road approaching a railroad crossing at Durant, Oklahoma. The soft, unpaved road puts all the brunt and strain of traffic directly on the culvert, but here as in thousands of similar installations Armco Iron Culverts are easily standing the strain.

Their corrugated form and overlapping joints give them great strength and toughness, and the purity and evenness of their material fits them for The Longest Service Life.

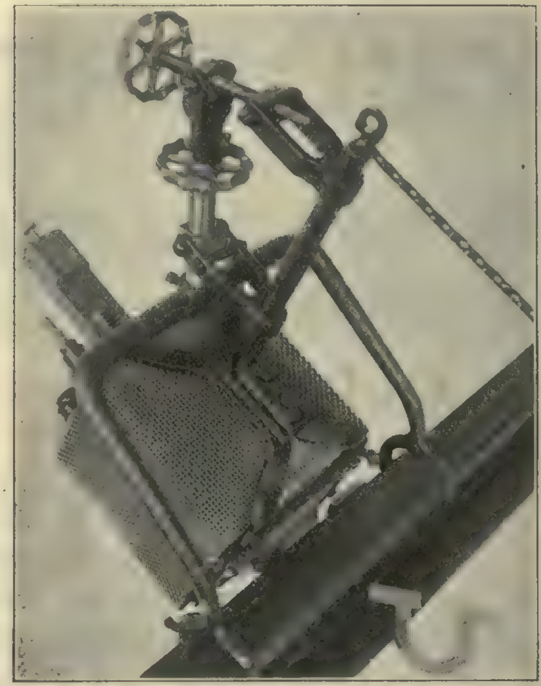
Write the Nearest Manufacturer for full information on Rust-Resisting "Armco" Iron Culverts, Flumes, Siphons, Sheets, Roofing and Formed Products.

AMERICAN ARMCO INGOT IRON

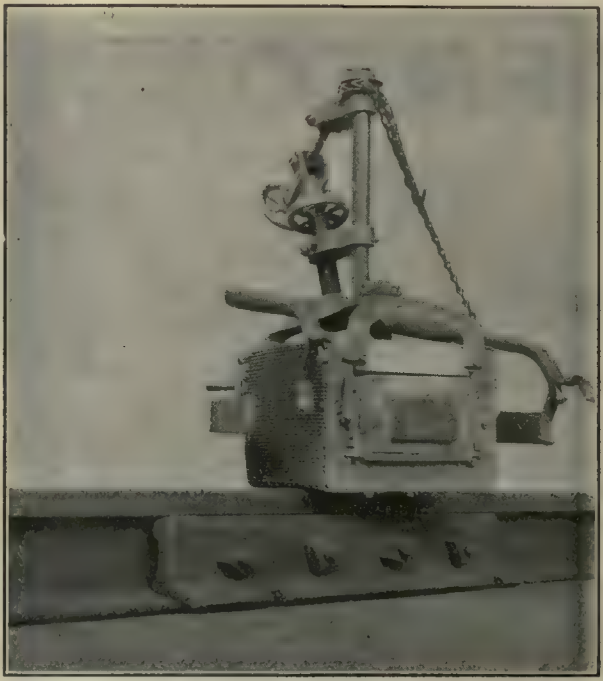
Resists Rust

Arkansas, Little Rock
Dixie Culvert & Metal Co.
California, Los Angeles
California Cor. Culvert Co.
California, West Berkeley
California Cor. Culvert Co.
Colorado, Denver
R. Hardesty Mfg. Co.
Delaware, Clayton
Delaware Metal Culvert Co.
Florida, Jacksonville
Dixie Culvert & Metal Co.
Georgia, Atlanta
Dixie Culvert & Metal Co.
Illinois, Springfield
Illinois Corrugated Metal Co.
Indiana, Crawfordsville
W. Q. O'Neall Co.
Iowa, Des Moines
Iowa Pure Iron Culvert Co.
Iowa, Independence
Independence Culvert Co.
Kansas, Topeka
The Road Supply & Metal Co.
Kentucky, Louisville
Kentucky Culvert Co.
Louisiana, New Orleans
Dixie Culvert & Metal Co.
Maryland, Munsey Bldg., Baltimore
Wm. M. Baker.
Massachusetts, Palmer
New England Metal Cul. Co.
Michigan, Bark River
Bark River Bridge & Cul. Co.
Michigan, Lansing
Michigan Bridge & Pipe Co.
Minnesota, Minneapolis
Lyle Corrugated Culvert Co.
Minnesota, Lyle
Lyle Corrugated Culvert Co.
Missouri, Moberly
Corrugated Culvert Co.
Montana, Missoula
Montana Culvert & Flume Co.
Nebraska, Lincoln
Lee-Arnett Co.
Nebraska, Wahoo
Nebraska Culvert & Mfg. Co.
Nevada, Reno
Nevada Metal Mfg. Co.
New Hampshire, Nashua
North-East Metal Culvert Co.
New Jersey, Flemington
Pennsylvania Metal Culvert Co.
New York, Auburn
Pennsylvania Metal Culvert Co.
North Dakota, Wahpeton
Northwestern Sheet & Iron Wks.
Ohio, Middletown
The Ohio Corrugated Culvert Co
American Rolling Mill Co.
Oklahoma, Shawnee
Dixie Culvert & Metal Co.
Oregon, Portland
Coast Culvert & Flume Co.
Pennsylvania, Warren
Pennsylvania Metal Culvert Co.
South Dakota, Sioux Falls
Sioux Falls Metal Culvert Co.
Tennessee, Nashville
Tennessee Metal Culvert Co.
Texas, Dallas
Wyatt Metal Works.
Texas, El Paso
Western Metal Mfg. Co.
Texas, Houston
Lone Star Culvert Co.
Utah, Woods Cross
Utah Corrugated Cul. & Flume Co.
Virginia, Roanoke
Virginia Metal Culvert Co.
Washington, Spokane
Spokane Cor. Culvert & Tank Co.
Wisconsin, Eau Claire
Bark River Bridge & Culvert Co.

Canada—Canada Ingot Iron Co., Ltd., Guelph, Sherbrooke, Winnipeg, Calgary



Top View



There's Little to Replace

with the

ERICO Portable Welder

The Erico Portable Welder is an outfit with amazingly few parts. Of these parts, the only ones that require renewal are the electrode and the graphite furnace chamber which fuses the terminals of the Erico Bond to the rail. It's an outfit whose maintenance expense will never worry you!

ERICO
THE LINE OF LEAST RESISTANCE

The Electric Railway Improvement Co.

Cleveland

Indianapolis Traction & Terminal Co.

added to the

RICO

SANITARY STRAP USERS

The first thing that meets *your* eye in the new cars recently put in operation by the Indianapolis Traction & Terminal Co. is the RICO sanitary strap equipment.

Rico Sanitary Straps create a "Public Be Pleased" policy. They are a good investment.

Address Sanitary Strap Department

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK

SIMPLICITY
HONESTY

Safety First in Arc Welding

There is no possibility of the operator being injured even though he should receive the full voltage, from the

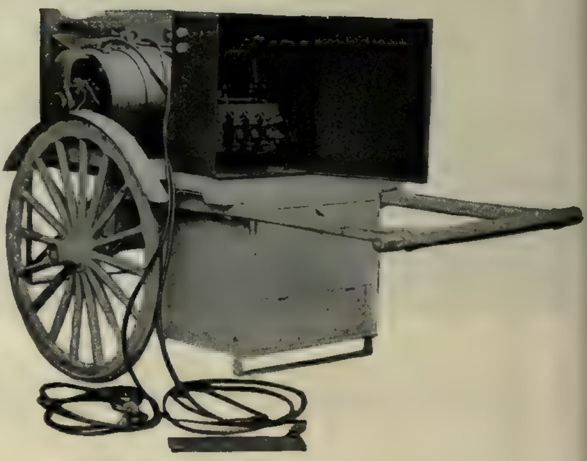
Lincoln Arc Welder

With the ordinary rheostat apparatus, formerly used for street railway welding, the operator, when not welding, holds an electrode carrying the full potential of the trolley line.

Should he accidentally touch the bare electrode or any part of the bare cable, he receives the full force of the current through his body.

This is not a theoretical danger but a very real one, as numerous accidents and fatalities testify.

Protect your workmen and avoid damage suits by using the Lincoln Arc Welder on your lines.



This is the outfit, a standard motor connected to a generator and all controlled by a single switch panel.

Write for Welding
Bulletin No. 50-J

This standard Lincoln Motor has operated under water for over 3 years without damage to windings.

The Lincoln Electric Co.

Cleveland, Ohio

New York City (Singer Bldg.)	Chicago	Philadelphia
Buffalo	Columbus	Pittsburgh
Syracuse	Detroit	Grand Rapids
	Charlotte, N. C.	Toronto, Canada

Agencies in other principal cities

SCHEDULE DEPT.
CLAIM DEPT.
TRANSPORTATION DEPT.
NPC
Door and Step Control
TREASURY DEPT.
MECHANICAL DEPT.

National Pneumatic Door and Step Control is Wanted by Many Departments

Your schedule department wants **National Pneumatic** door and step control because it speeds up traffic.

Your transportation department wants **National Pneumatic** door and step control because it makes life easier for platform men.

Your treasury department wants **National Pneumatic** door and step control because the car will make more mileage and the conductor will miss less fares.

Your claim department wants **National Pneumatic** door and step control because the platform men are in far better position to control passenger movement.

Finally

Your mechanical department wants **National Pneumatic** door and step control because the smoothness, certainty and uniformity of pneumatic machinery replaces the unevenness of human labor—thus conserving the life of the doors and adjacent equipment.

NATIONAL PNEUMATIC COMPANY

50 Church St. New York
515 Laflin St. Chicago

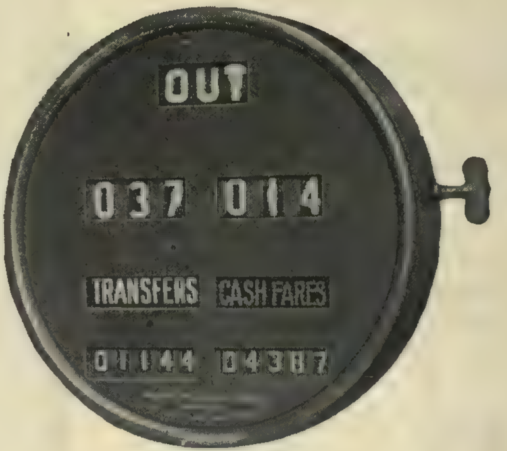
Are you satisfied with your fare-collection system?

Recorder

If you're looking for a complete **automatic** record of the day's work for each car—a record that can be removed and kept on file, or

If you're finding any trouble whether it be in checking fares—wasting conductor's time in clerical work—depending on quickly-jotted-down data or otherwise—you can correct these faults by installing

Dayton
Fare Registering Equipment



Sterling No. 16

Dayton devices are absolutely accurate, reliable, and economical. There's a type for every need in fare collecting or recording.

Write now for catalog.

The Dayton Fare Recorder Co.
Dayton, Ohio, U. S. A.

Dayton No. 101

What service is each interurban division entitled to?

Where does your passenger traffic originate, and where does it go?

Are there parts of your line where the traffic is excessively heavy, and other parts where it is too light to pay?

Can you, without excessive cost, determine your earnings per passenger mile?

Can your secret service men positively check your trains?

Is your ticket revenue automatically separated from your cash revenue?

The Bonham Traffic Recorder

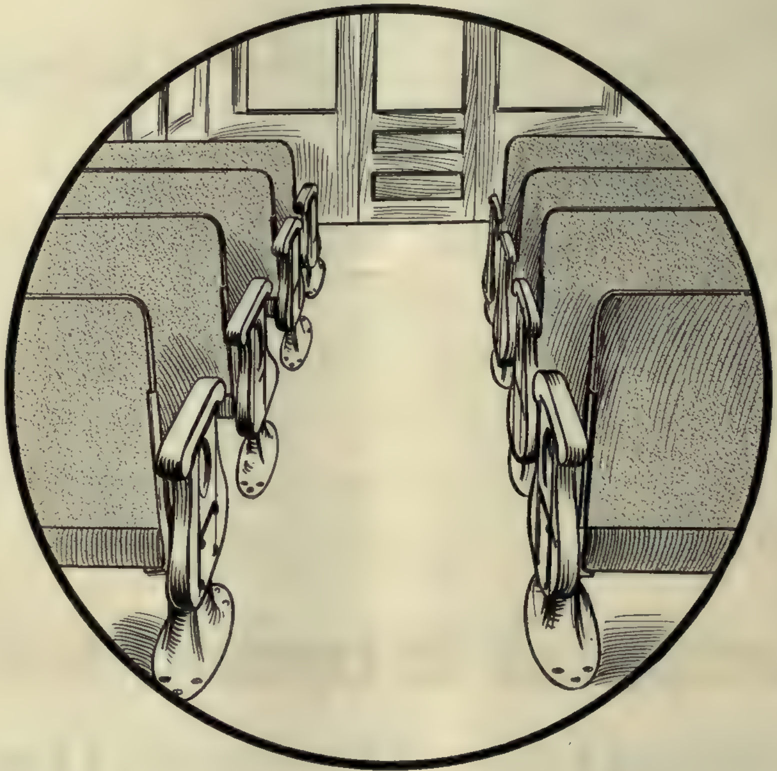
accomplishes all this rapidly, simply and accurately. It does automatically what it would take a large corps of checkers to do. It produces a printed record showing:

- The "On" and "Off" points of each passenger.
- The passenger miles.
- The classification of each fare and the amount of each cash fare.
- The date, train number and division.
- The density of traffic.
- The total passengers.
- The total cash passengers.

The Bonham Recorder Co.

Hamilton, Ohio

Like Soldiers at Drill



is what you'll say when you look down an aisle flanked by the handsome pressed steel armrests of the Hale & Kilburn No. 199 AE interurban seat.

Of course, there's more to the armrest than its beautiful embossing and its mahogany capping. Its firmness, its rigidity will convince you that there is nothing flimsy in any part of a Hale & Kilburn seat.

The Armrest of an Interurban Seat

fulfills several purposes. It keeps the occupant within the limits of the seat and so prevents him from sprawling into the aisle; a still more important purpose is to save the rider from being thrown off the end of the seat at curves.

By giving due attention to the design of the armrest, we utilize every inch to the greatest advantage consistent with clear ingress and egress of the inside passenger past the occupant who is alongside the aisle.

The No. 199 AE is often fitted with the Hale & Kilburn adjustable, single-rail footrest. Of course, it is also built with the famous Hale & Kilburn "Walkover" mechanism which makes reversing so easy.

This seat is used on many of the finest interurban cars. You'll like it, too!

Pioneers in Steel Trim for Passenger Cars, including interior finish, steel doors, etc.

HK WALKOVER COPYRIGHTED

Hale and Kilburn Co.

Philadelphia New York Chicago
Washington Atlanta San Francisco

HK WALKOVER COPYRIGHTED

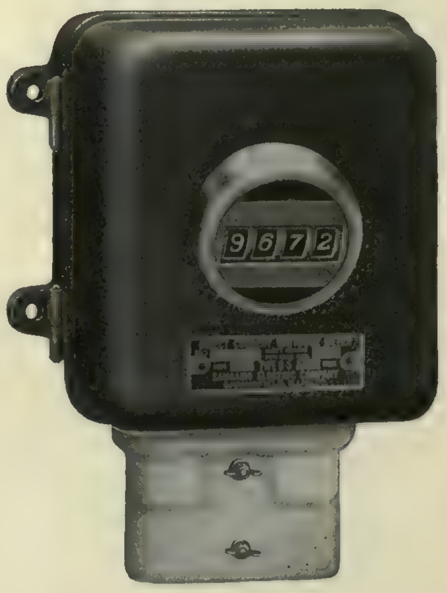
Efficiency With Safety on the Down Grade

There are two methods of coasting down grade.

(1) A motorman can coast with brakes lightly applied, and his car under perfect control.

(2) He can also coast with both power and brakes off.

If his car is equipped with an



Economy Meter

the motorman uses the first method of coasting. He does this because—

He is rated by the *power* he uses.

When he shuts off power his meter stops.

He has been taught to be stingy with his power rather than with his brakes, and such teaching is an important factor in this case.

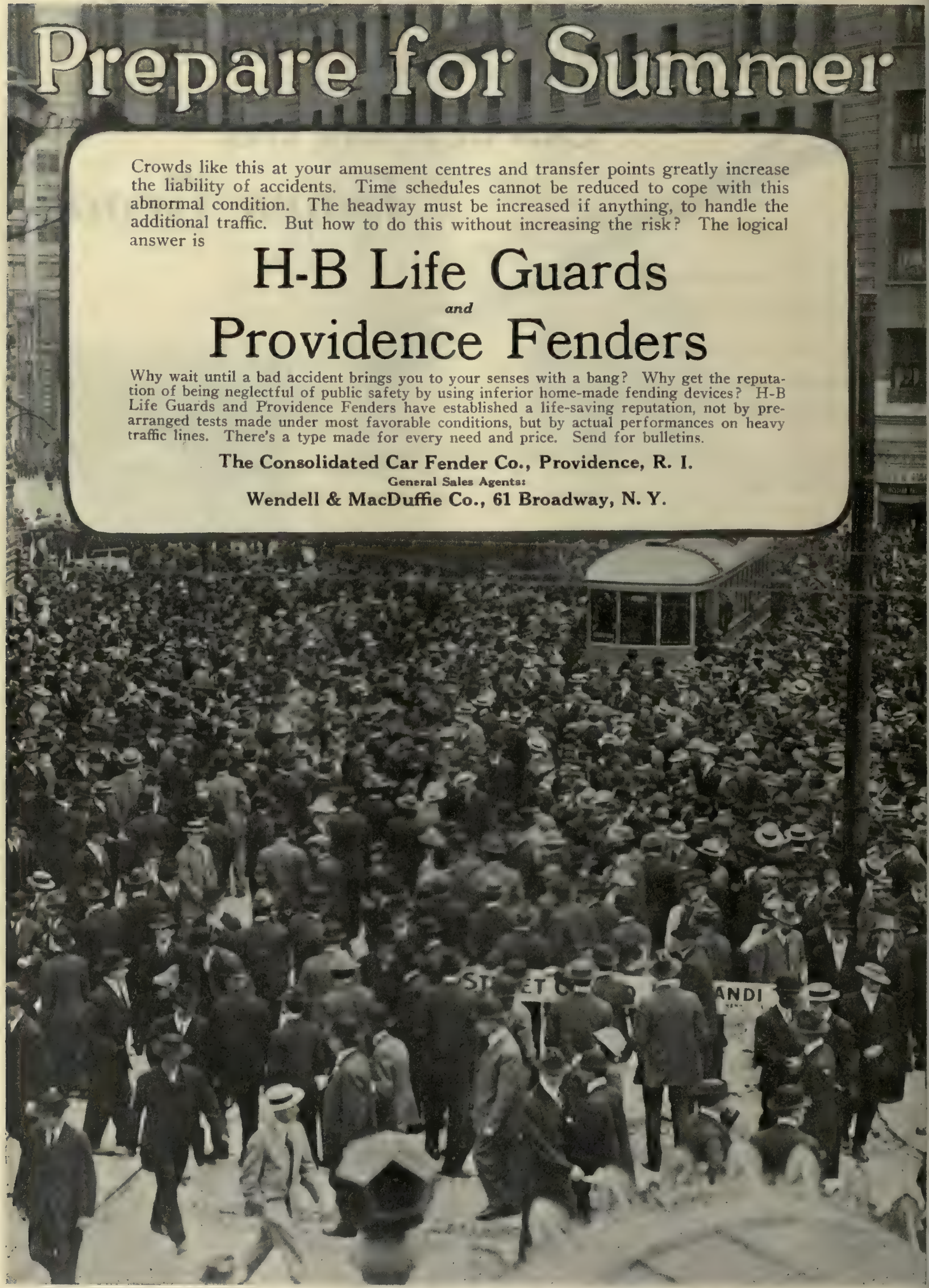
He gains no coasting records, but he helps his *efficiency* record and operates his car on *a safe basis.*

"*Safety First*" is the most important slogan for the motorman to remember, especially on the down grade. The Economy metered motorman realizes that practising this motto means practising efficiency.

ECONOMY
SANGAMO
BUILT LIKE A WATCH
METERS

Sangamo Electric Company
Springfield, Illinois

Specialists in Meters for Every Electrical Need



Prepare for Summer

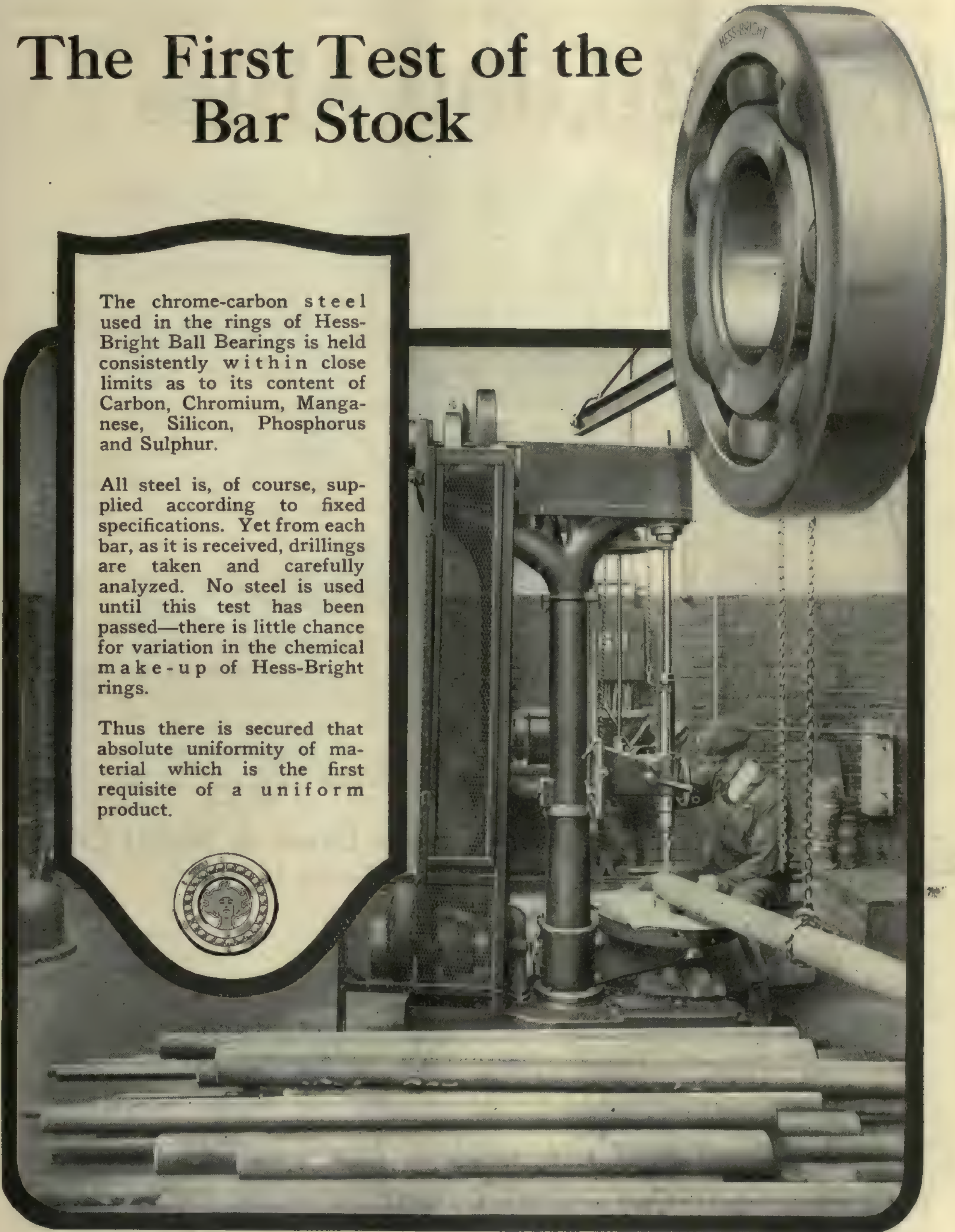
Crowds like this at your amusement centres and transfer points greatly increase the liability of accidents. Time schedules cannot be reduced to cope with this abnormal condition. The headway must be increased if anything, to handle the additional traffic. But how to do this without increasing the risk? The logical answer is

H-B Life Guards
and
Providence Fenders

Why wait until a bad accident brings you to your senses with a bang? Why get the reputation of being neglectful of public safety by using inferior home-made fending devices? H-B Life Guards and Providence Fenders have established a life-saving reputation, not by prearranged tests made under most favorable conditions, but by actual performances on heavy traffic lines. There's a type made for every need and price. Send for bulletins.

The Consolidated Car Fender Co., Providence, R. I.
General Sales Agents:
Wendell & MacDuffie Co., 61 Broadway, N. Y.

The First Test of the Bar Stock



The chrome-carbon steel used in the rings of Hess-Bright Ball Bearings is held consistently within close limits as to its content of Carbon, Chromium, Manganese, Silicon, Phosphorus and Sulphur.

All steel is, of course, supplied according to fixed specifications. Yet from each bar, as it is received, drillings are taken and carefully analyzed. No steel is used until this test has been passed—there is little chance for variation in the chemical make-up of Hess-Bright rings.

Thus there is secured that absolute uniformity of material which is the first requisite of a uniform product.

HESS-BRIGHT

PHILADELPHIA

Hess-Bright's Conrad Patents are thoroughly adjudicated.

Up to 26,000 Miles

Are Being Made from V-K Trolley Wheels by the Virginia Railway & Power Co.

The Virginia Railway & Power Company is operating V-K trolley wheels under both copper and steel wire.

Under the copper wire, V-K Wheels are making as much as 26,000 miles.

Under steel, they are making a lower mileage naturally, but it is significant that they give double the life of other wheels in the same service.

Write us for some interesting data about performance records made by V-K equipment

Further information and prices on application

More-Jones Brass & Metal Co.
St. Louis, U. S. A.

Manufacturers of

Trolley Wheels and Harps, Contact Springs, Motor Axle Bearings, Armature Bearings, Truck Journal Bearings, Air Compressor Bearings, Armature Babbitt Metal and Similar Products.

V-K

OILLESS TROLLEY WHEEL
and
NON-ARCING HARP

TIME

In railroading everything depends on *time*. Loss of time means loss of money.

Cars in the shops mean *time lost*. Removing wheels, turning, grinding of wheels, adjusting—all mean loss of time and money.

Davis Steel Wheels are one-wear wheels. Maintenance expense is reduced, cars are kept in service—time, the most valuable of all commodities—is saved.

AMERICAN STEEL FOUNDRIES
1100 McCormick Building CHICAGO

RICHEY'S ELECTRIC RAILWAY HANDBOOK

SENT ON APPROVAL-NO MONEY DOWN

LAYOUT—EQUIPMENT—OPERATION—MAINTENANCE

of electric railways are fully covered in this handbook.

Every section is a clear, condensed statement of the best modern practice. There are valuable tables and diagrams for quick reference. Every item is indexed so that you can find it instantly. In printing, paper and flexible binding the book represents an ideal—a real tool.

In determining the scope of the book these ideals have been kept in mind:

(1) To present data on subjects which come up in every-day electric railway practice for constant use by the operating, constructing or designing engineer.

(2) To produce a book of service to the non-technical manager or operator as well as to the engineer.

(3) To produce a reference book on electric railway practice for those who may be specializing in other or allied lines.

LIST OF SECTIONS

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IV.—Railway Motors; 109 pp., 99 illus.
V.—Controlling Apparatus; 55 pp., 39 illus.
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XI.—Signals and Communication; 35 pp., 32 illus.

By **Albert S. Richey,** Electric Railway Engineer, Professor of Electric Railway Engineering, Worcester Polytechnic Institute. 832 pages, flexible leather, full-gilt edges, 4 x 7 inches, pocket size, with over 600 illustrations.

$4.00 net, postpaid

McGRAW-HILL BOOK CO. INC.
239 WEST 39TH STREET, NEW YORK

LONDON: HILL PUBLISHING CO., LTD.
6 & 8 BOUVERIE ST., E.C.

Publishers of Books for Electric Railway Journal

FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc., 239 West 39th St., New York, N. Y.

You may send me on 10 days' approval:

Electric Railway Handbook, $4.00 net.

I agree to pay for the book or return it postpaid within 10 days of receipt.

....I am a regular subscriber to the Electric Railway Journal.
....I am a member of A. I. E. E. or A. E. R. A.

(Signed) ....

(Address) ....

....

Reference .... E 5-26

(Not required of subscribers to the Electric Railway Journal or member of A. I. E. E. or A. E. R. A. Books sent on approval to retail customers in the U. S. and Canada only.)

538 Rico Coasting Recorders in the Service of the Boston "L"

The Brady Safety Medal Road

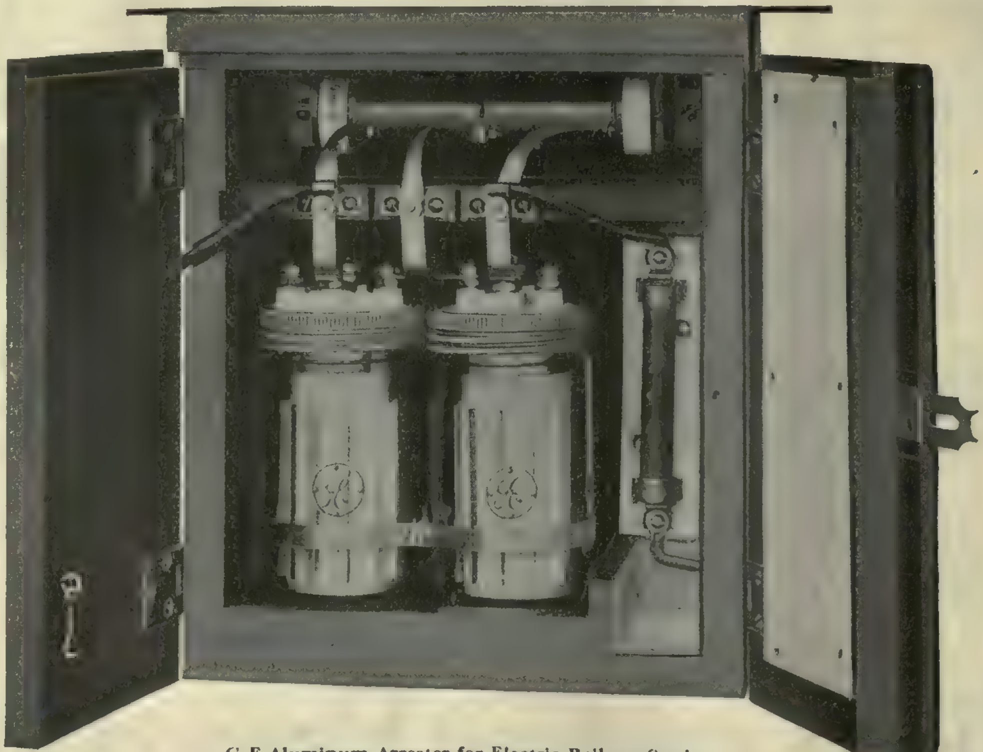
The Boston Elevated Railway placed in service 461 Rico Coasting Recorders covering all its elevated and subway cars. With the purchase of more cars, this company ordered 77 additional Rico Recorders. Is it not significant that the Boston Elevated Railway, which holds the Brady Medal for Safety, should have adopted the Rico Coasting Recorder for its guide in securing better service at lower cost on all its rapid transit routes?

Like so many other great electric railway systems, the Boston Elevated Railway has concluded that exact knowledge of *coasting time* is

The True Principle for Measuring Operating Efficiency

Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK



G-E Aluminum Arrester for Electric Railway Service

No More Shutdowns

"*Complete Satisfaction*" is the expression of electric railway companies having hundreds of G-E Aluminum Arresters in use on their cars. Railways which heretofore have suffered severe interruptions and damaged motors from electrical storms, now report absolute freedom from such troubles. One satisfied user expresses his experience in this manner:

> ***"Before installing these arresters we had to shut down during severe storms, and then we had a number of 'Pull-ins'. We never cut off current now."***

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Cable Message from Mr. Dalrymple of Glasgow

Glasgow, May 18, 1917.

To the Electric Railway Journal:

The tramway men of Scotland are extremely pleased that they will soon be fighting shoulder to shoulder with the street railway men of America. During the early weeks of the war our tramway men in Scotland literally sprang to arms, and they have done nobly on every battle front. Three thousand Glasgow tramway men are with the colors. The women in the meantime are holding the fort. Nearly every car in Scotland has now a woman conductor and very soon will have a woman driver.

If the street railway men in America will throw themselves heartily into this struggle, the fight will soon be over. The tramway men of Scotland greet you as comrades in arms.

James Dalrymple,
General Manager Glasgow Tramways.

(This cablegram was received from Mr. Dalrymple in reply to a suggestion from the Electric Railway Journal that a message from him in regard to the war in which Great Britain and the United States are now allies would be appreciated by the electric railway men in this country.)

SOLICIT FREIGHT TO RELIEVE STEAM ROADS With the onset of war conditions there is certain to be more and more serious interference with the normal progress of freight traffic on the railroads. The causes are manifold—real shortage of rolling stock, cars tied up at ocean terminals in default of proper storage facilities or of shipping, more cars held up deliberately by speculators in foodstuffs waiting to make a quick turn, hasty shipments of great quantities of material to particular and unusual termini. These and other causes make the situation a particularly complicated one, and to this will presently be added the work connected with mobilization and transportation, sending again large quantities of men and material over somewhat unusual routes. Here is an opportunity for the electric roads to develop their freight business and thus help the government as well as the public. But this opportunity to help is not going to be thrust upon the electric railways by a conservative public, no matter what difficulties may be experienced by the shippers over steam railroad routes. If any electric railway is prepared for such service it must get that fact before the public and keep it there. To this end we suggest that special publicity be given to possible routings made altogether over electric lines.

GOVERNMENT AND BUSINESS The decision of the administration to use expert advertising assistance in setting forth the advantage of the new Liberty Loan to the public is a wise move. Many persons who would not think of arguing their own cases in court or of having anyone except a trained surgeon perform an important operation upon themselves consider any sort of an announcement will do when it comes to advertising. Nothing can be farther from the fact. Advertising is a science, and the decision of the administration to utilize the expert knowledge and existing advertising channels which have been offered to it free, both by the new cards which will be carried in the electric railway cars during the next three weeks and by other methods of advertising the bonds, shows good business sense. The example is one which Congress could well follow, as its latest proposal in regard to the second-class mail rates indicates a fundamental lack of conception of business needs. While various administrative branches of the government are asking the assistance of the business papers in furthering the government plans—an assistance which they are glad to supply and are now supplying—the House seems to be trying to make that service impossible or greatly to restrict its usefulness by an enormous increase in the postage rates.

ADD AUTOMOBILE MERITS TO RAILWAY SERVICE When a railway finds itself faced by unrestricted or inefficiently restricted jitney competition, it is perfectly natural to point out the unfair advantages enjoyed by the newcomer. But instead of putting the matter up to the public's sense of justice and fair play alone, the railway might well ask itself the question: "What is there wrong about our operation that people should prefer the other means of transit?" This thought is prompted by what we have seen lately in a city where the jitney is still rampant. Restriction after restriction has failed, and now the city is asked by the railway to keep the jitneys off of the main streets during the hours of congestion. It is but fair to say that this company has always given excellent service on short headways, and that its men are most courteous to the public and most loyal to the management. Why, then, does a large portion of the public prefer the jitney? One reason is that it is far easier to get in and out of an automobile than to risk this company's dangerously high car steps. Another is, that the low rate of acceleration plus the low rate of passenger interchange (due to high steps) makes the car speed absurdly low. It would cost a great deal of money to remove these handicaps, but it will cost more to stay behind the times. Regardless of past virtues or past sins, what the people want is good service, and they will inevitably prefer that which proves best for their own comfort and well-being quite regardless of the subtleties of taxation, paving upkeep and the like. The electric railway which wants to remain the carrier of the commonalty must not and cannot overlook the fact that the automobile has created in the public a taste for faster and more pleasing transportation than is offered by the high-step, low-acceleration, many-stop car which is already entering the land of yesterday.

TAXATION TO INCREASE PLATFORM WAGES

Developments in the San Francisco Municipal Railway situation bring out clearly the fact that in this era of rising prices a publicly-owned road is not necessarily a bonanza even when it is operated in choice territory and is well managed. San Francisco is discovering that the nickel of its own railway can no longer stand the strain. Of course, it has been pointed out many times in these columns and elsewhere that if the municipal railway had to carry the same burdens of taxation as its privately-owned neighbor the profits would be largely conjectural. With the latest action of the Board of Works, however, there is a frank declaration of an impassé.

It appears that on Monday, May 7, the Board of Works recommended that the car and shopmen of the Municipal Railway receive an increase of 50 cents a day, namely, from $3.50 to $4 a day. Thomas A. Cashin, superintendent, had previously explained that this increase would cost the city $93,000 a year. As the Municipal Railway had earned only $5,600 net profit between July 1, 1916, and Feb. 28, 1917, the Board of Supervisors (which passes on wage recommendations) is presented the pleasing task of drawing a gallon of wine from a flask holding a gill. As even San Francisco politicians can't do that, the money will have to come out of the 18 per cent of the gross earnings that has been set aside for depreciation, redemption and bonds, or out of the tax levy. In plain English, all of San Francisco's citizens are to be assessed in some form for the sake of some of San Francisco's citizens.

No matter what the outcome, the public will receive a few more important lessons in municipal electric railway economics. It will have to decide eventually whether public utilities are to be run as a business proposition to "relieve the rates," as in England, or as a public highway which may increase realty tax values, but which brings no direct returns. If the latter view should prevail, municipal operation would no longer be comparable with private operation. The barrier interposed by capable management would be broken down, and San Francisco's big-hearted supervisors would run riot with the city's tax and bonding powers.

FARE INCREASES NEED NOT WAIT ON VALUATIONS

Now that the street railway lines of New York City, following their announcement of last week, have filed formal application with the Public Service Commission for a charge of 2 cents on transfers, opposition is appearing. This, of course, was to be expected. With the experiences of the railways in asking rate increases from the Interstate Commerce Commission before the companies, no other result, however serious the situation, could be looked for.

But the character of that opposition, thanks to the frankness with which the railway officials have stated their position, differs from the past. Opponents of the charge on transfers have largely been reduced to one argument, the old argument of valuation. The invitation of President Shonts to the Chamber of Commerce and other civic bodies to examine the affairs of the New York Railways Company before making their decision whether the proposed charge was justified appealed to the public as being fair. As a result, there has been a notable inclination on the part of public-spirited citizens and newspapers to withhold judgment until the facts had been fully presented. This in itself is a distinct victory for the methods pursued by the companies.

The argument for valuation as a basis for the proper determination of fare increases is traditional. It has been met by every railroad, every street railway, every public utility when confronted with the necessity of meeting increasing costs by obtaining additional revenues. And nearly every public service corporation that is subject to commission regulation at some time or another in recent years has had such valuations made.

In New York, both in the city and up-State, the electric railway companies have contended that if disaster to many properties were to be averted, there was no time for valuation. The whole basis of their plea was immediate relief. To wait for one year or two years while tedious inventories were taken would be to summon the doctor after the patient was dead.

One peculiar feature of the situation confronting the companies this year is also overlooked by the valuation advocates. For the companies it is an argument that should have the strength of Macedonian phalanxes. And that is fares based on the value of service.

Assuming that electric car service given five years ago was worth the price charged for it—that is, the same nickel that had bought street car rides since Civil War days—if the ride was worth the nickel then, surely the same ride is worth more now. Otherwise, the buying power of the nickel is the same as five years ago. And the present high prices prevailing in every phase of life refute any such argument.

The point is that those who advance the valuation argument in opposing increased fares or charges for transfers on the electric railways are hiding behind a subterfuge. They are not willing to face the issue squarely. They are seeking to deny elemental justice in a situation where the facts are clear-cut and simple. They are forced to recognize in their own pocketbooks the increased cost of living in every commodity, in every article of food, clothing and material they use.

They see these increases offset to a degree by advances in wage and salary levels.

The electric railway companies must keep pace in all these increases. They must raise wages when other employers raise wages. They must pay more for materials and supplies. And yet, when they ask for commensurate advances in the cost of the commodity which they sell—transportation—they are met with the argument that increases must not be determined by what it costs to operate, but by how much it costs to start the business.

GET CAR MEN INTERESTED IN THE POWER PLANT

The Public Service company section of the American Electric Railway Association last week visited the latest power plant of the Public Service Electric Company. Such an inspection should be very useful to the transportation department of the railway in inaugurating the power-saving campaign which it is planning, for the reason that the inspection will give the men a better conception of what it is that they are expending when they are driving their cars.

There is nothing more intangible than electrical energy, but the coal pile is a perfectly definite, concrete thing. If the platform man, as he manipulates his controller and brake handle, could be brought to consider whether he is saving or wasting coal, as the case may be, he is far more likely to save than if he tries to think of what he is saving in terms of abstract energy. In former editorials we have endeavored to visualize the energy used by a car by stating, for example, that 125 watt-hours (the energy consumed per ton-mile under ordinary city conditions) is equivalent to 166 ft.-tons or 10 hp.-minutes, or that it will light a 20-cp. tungsten lamp for five hours, or that it will raise the temperature of a cubic foot of water about 7 deg. Fahr.

These examples are all right as far as they go, but if it is possible to familiarize the platform man with the power plant itself, especially if the route of the energy from coal pile to feeder line can be pointed out to him in simple language, his co-operation in energy saving should be more easily obtained. He can be made to realize that if he makes a car mileage of, say, 100 per day he controls the consumption of something like 1200 lb. of coal, or considerably more than a half ton per day. By saving 10 per cent of this amount, which is well within his reach, he could reduce the coal consumption by 20 tons per year. As coal is a commodity which everybody has to buy, there is no doubt that a staggering figure like this would appeal to any man intelligent enough to control the destiny of a carload of passengers. It will, therefore, pay every railway manager to interest his men in his own power plant or that from which his road purchases energy.

TIME FOR UNITED ACTION

The responses from public service commissions throughout the country to the general letter sent out by John Nickerson, Jr., asking their attitude on the question of fare increases—noted on another page—are deserving of more than passing attention by officials of all electric railway companies. They carry a message of hope, however slight it may be, for which operators of public utilities have long been waiting.

The question of increased costs, as it relates to street railway fares, at last has forced itself on the commissions. That is plainly the meaning of the responses to Mr. Nickerson's letter. No matter how much the commissions may wish to gain time and plead that they cannot commit themselves until the "question is brought before them," the dilemma of the companies is now squarely up to the regulating bodies. The applications filed by the companies in New York mean that they must make a decision.

With the question which has been worrying operating officials for years thus brought definitely to a head, the duty of all the electric railway companies in the country is clear. The problem is a common problem. It is as vital in California as it is in Maine. New York has led the way with a united stand. The companies of every other state will be forced by economic circumstances to follow with similar applications. They have the consciousness that right is on their side, and they must act. The moment for which they have hoped and prayed has come. And it is now or never!

For, after all, the cause in Illinois is the same as the cause in New York. If a higher fare is needed in Rochester, N. Y., or in Buffalo or Syracuse, or other cities in the State, it is needed in Springfield, Mass., or Erie, Pa. The reasons underlying the necessity for the increase are universal. They are not confined to the electric railway business, but are only part of the general economic conditions brought on by the war.

Electric railway companies are fighting for this increased fare, not merely as part of the right to live, but because only by such increases can the progress of the transportation industry be assured. Business cannot stand still any more than life can. It must either go forward or slip back; and the street railways have always gone forward, from the days of the horse car and through the various transformations which have followed since horses were used. An end, however, has now been reached. Wages, taxes and the cost of materials have become so high, and the lengths of ride have so increased, that there is now nothing left of the nickel. Relief is urgently needed, and Mr. Nickerson's replies may fairly be interpreted as evidence that some of the public service commissions of the country recognize this fact.

SKIP-STOP IN BALTIMORE—The leading article in next week's issue will tell how the United Railways & Electric Company has educated its public to an appreciation of the advantages of the skip-stop plan by showing that it conduces to better service.

Double Guards Reduce Cost

Guards on the Outer Rails of Curves Increase the Life of Rolling Stock and Effect a Considerable Reduction in Maintenance Cost

By **WILLIAM H. STEVENSON**
Engineer Philadelphia (Pa.) Holding Company

THE necessity for the double guarding of rails on curves has been emphasized whenever the writer has interviewed a specialist or an engineer who has scientifically studied the problem of curve conditions. The opinion, however, of many less competent to judge is that the outer guard on curves increases noise and adds friction without giving any benefit other than "to kick the truck around" which, in reality, is necessary as the wheel is kept in the desired position on the rail. In many cases the outer guard has been abandoned merely to cut down the initial cost.

SINGLE GUARDED CURVES PROVE HAZARDOUS

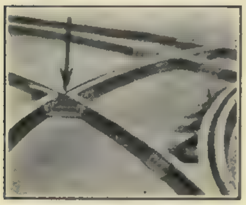
The thrusts of a wheel on a curve exert a tremendous weight against the inner guard due to a centrifugal force that tends to throw the track out of gage. There is also a tendency for the wheel to ride the inner guard, especially if the guard is dry and gritty. If the flanges are worn and somewhat sharp, the throat of the outside flanges may ride the head of the outside rail and thus make the inner guard of little or no value. Should the flange of the inner wheel be slightly chipped on the back, and this defect meet the rail at a moment when the flanges of the outer rail were grinding against a rail head, a derailment would be certain to occur. This, however, would be impossible in case of a double guard, as the wheel would be thrown sufficiently around to prevent an accident.

A single guard is of little value when opposite an unprotected frog in the outer rail, as it will not prevent a wheel from riding the point of the frog or causing a derailment. This condition is clearly shown in the accompanying illustrations, Figs. 1 and 2, which indicate how the flanges may be intercepted by the point of the frog when no approach guard has been provided. In Fig. 3 is shown a frog protected by a small V-shaped guard that is placed at the entrance to the frog and either bolted or cast to it. The cost of installing this device and double-guarding the curves on an entire system would frequently be less than the damage resulting from one derailment.

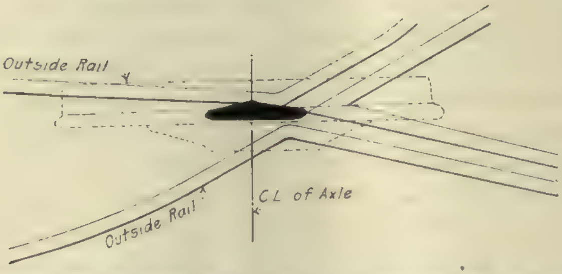
RESULTS OF THE STRAIN FROM NO OUTER GUARD

The strain on trucks due to improper guarding and gaging of rails on curves cannot be computed, but the disastrous results may be observed at the carhouses. Here are found wheel flanges worn to many sizes and shapes, trucks out of alignment, motor bearings unevenly worn, gears worn to various freak forms, and many broken parts, including corner gussets, diagonal tie rods and frequently axles.

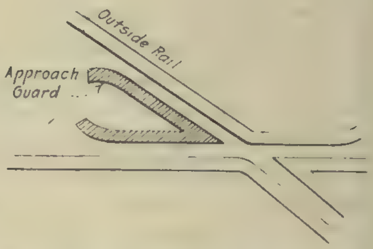
The use of the outside guard adds to the life of a wheel as it prevents the excessive wearing down of the flange. The accompanying illustrations compare the wear on wheels and flanges resulting from the use of both single and double guards. Fig. 4 shows the out-



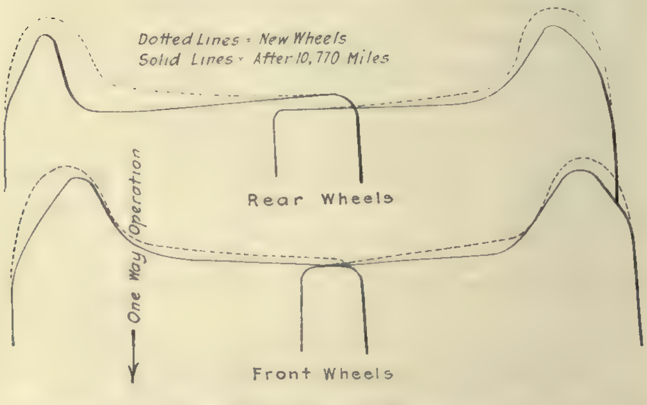
DOUBLE GUARD FOR RAILS — FIG. 1 — FROG UNPROTECTED BY APPROACH GUARD



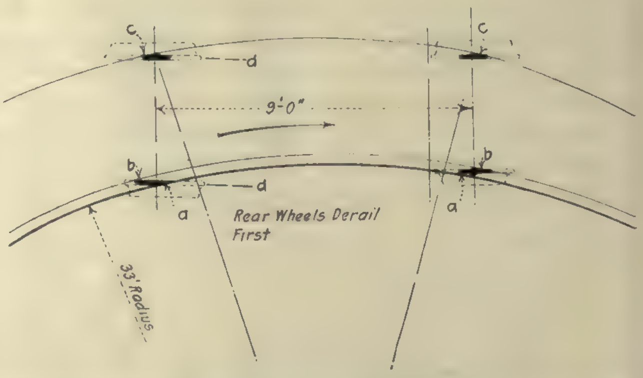
DOUBLE GUARD FOR RAILS—FIG. 2—POSITION OF WHEEL ENTERING FROG WITH NO APPROACH GUARD



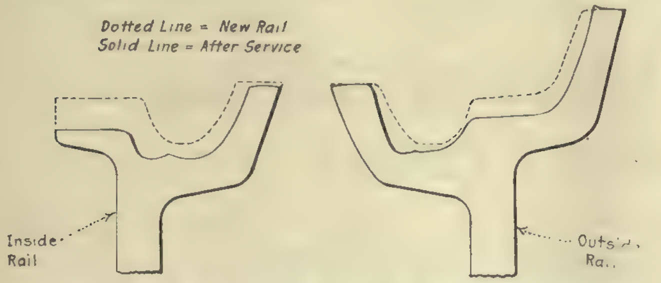
DOUBLE GUARD FOR RAILS—FIG. 3—FROG WITH APPROACH GUARD



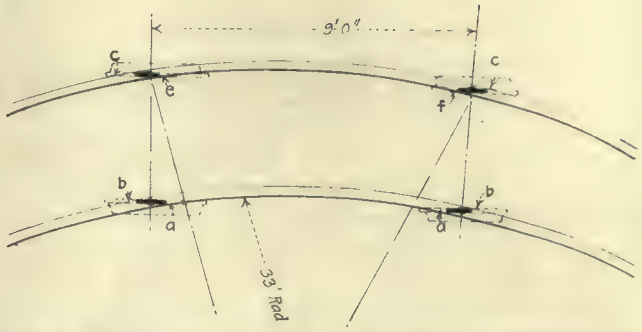
DOUBLE GUARD FOR RAILS—FIG. 4—WEAR FROM SINGLE-GUARDED CURVES



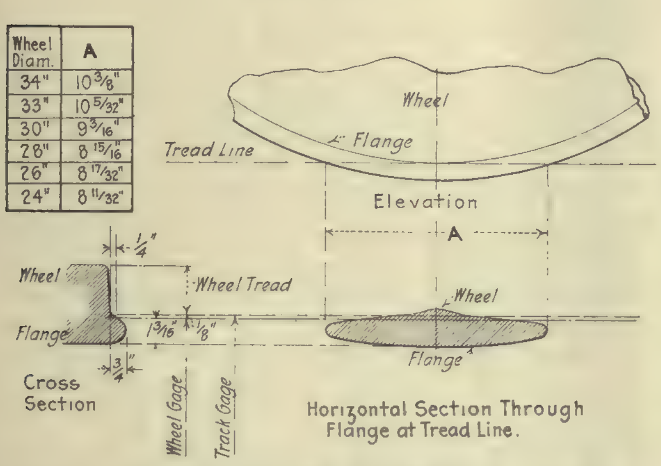
DOUBLE GUARD FOR RAILS—FIG. 5—POSITION OF SINGLE-TRUCK CAR ON SINGLE-GUARDED CURVE



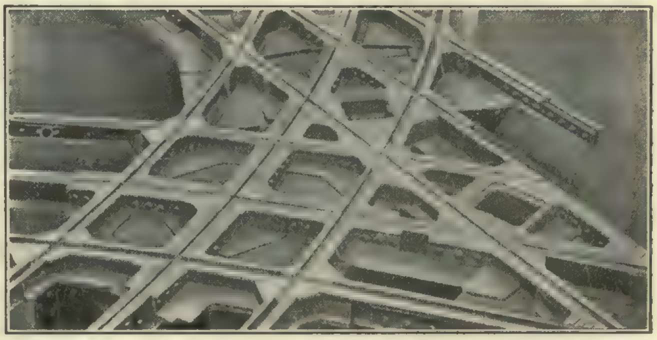
DOUBLE GUARD FOR RAILS—FIG. 6—WEAR FROM DOUBLE-GUARDED CURVES



DOUBLE GUARD FOR RAILS—FIG. 7—POSITION OF SINGLE-TRUCK CAR ON DOUBLE-GUARDED CURVE



DOUBLE GUARD FOR RAILS—FIG. 8—LENGTH OF FLANGE (A) IN GROOVE OF RAIL AT TREAD LINE



DOUBLE GUARD FOR RAILS—FIG. 9—CAREFUL GUARDING ASSURES ABSOLUTE ALIGNMENT OF TRUCKS

line of wheels before and after a run of 10,770 miles over single-guarded rails, or less than one-quarter of the guaranteed life. In Fig. 5, illustrating the position of a car on a single-guarded curve, is shown the wide groove between the single guard and the rail, the position of the axle as having no apparent relation to the radii of the curve, and the points of circular shear of the wheels against the rails. The points of contact of the flanges against the rail are indicated by the letters *A*, *B* and *C*. The dotted line *D* indicates the direction the wheels take when a derailment occurs.

OUTER GUARD LESSENS WEAR ON RAILS AND WHEELS

Figs. 6 and 7 illustrate the wear on rails and the position of the car axles when the double guard is used. The rails shown in Fig. 6 were removed from the Delaware Avenue and Market Street loop, Philadelphia, Pa., after three years of service when 16,000,000 wheels or 4,000,000 cars had passed around the curves. The tracks are located on a 10 per cent grade and the radius of the curve is 23 ft. ¾ in. to the inside rail. Fig. 7 shows the same wheelbase as Fig. 5, but on a double-guarded curve, where the guard rails engage the flanges as indicated by the letters *E* and *F*, and thereby tend to throw the wheels and axles to their natural position.

Wheel diameter in inches	34	33	30	28	26	24
A in inches	10 3/8	10 5/32	9 3/16	8 15/16	8 17/32	8 11/32

The plan and cross-sections of the flange of the A. E. R. A. standard wheel are shown in Fig. 8. The cross-section to the left is developed on the tread line of the wheel, and the one above the plan shows the position of a wheel on a rail and indicates the length of flange (*A*) extending below the tread line. The horizontal section shows the flange and wheel cut at the tread line. In the table are shown the approximate lengths of this horizontal section, or the length of the flange extending into the groove of the rail for wheels ranging from 24 in. to 34 in. in diameter and having a ¾-in. x 1 3/16-in. flange, which is the prevailing size for city service.

Fig. 9 shows a layout where an absolute alignment of trucks on long sweeps and the use of the underground contact system necessitated a careful guarding of both rails.

RAILS SHOULD BE KEPT CLEAN AND WELL GREASED

Careful study and tests indicate that most of the wheel slipping on curves occurs with the inside wheel, and that all slipping takes place on the inside rail when the curves are carefully laid out and double guarded. Therefore care should be exercised to keep the curves clean and in no case should sand be used on the inside rail. It should also prove economical to keep both rails clean and the guards on short curves greased wherever local conditions will permit.

Noises caused by wheel grinding around curves can only be overcome by causing the flange to follow the rail in its natural tangential course, with the center line of the axle pointing near by along the radii of the curve. It is impossible for this to occur with a rigid truck on a single or double car, but with a flexible or radial axle truck this ideal condition must exist if both of the rails are properly double guarded.

In conclusion, the double guarding of rails is desirable not only for the reasons already given, but also as a preventive of corrugation. This corrugating may be overcome on both long and short sweeps of regular, irregular or spiral curves by installing inner and outer guard rails close to the main rails and even with the main rail-tread lines, provided the rails are carefully gaged. This method, the writer feels, is a solution of the rail corrugation question as applicable to curves.

An Inexpensive Way of Cutting Construction Costs

The Author Shows How Co-operation Among Departments Tends to Eliminate Waste—He Gives a Practical Plan by the Employment of Which Such Co-operation Can Be Assured

BY FRANK B. WALKER

Assistant Engineer Maintenance of Way Department Bay State Street Railway, Boston, Mass.

THERE has been so much written and said regarding efficiency and cutting costs in connection with the carrying out of maintenance and construction work that the writer has not the courage to try to bring out anything new on this subject. What he has to offer at this time is not entirely new on some of the progressive and economically managed steam railroads, although probably not so well known on the electric railways.

The plan, briefly stated, is (1) to have full and complete details of work to be done written up in an "authority for expenditure" or "work order"; (2) to distribute enough copies of the "authority for expenditure" thoroughly to inform all concerned; (3) to have frequent checking of costs during progress of work; (4) to have frequent complete reports of status of progress; (5) to write up statements of charges of the work when completed; (6) to analyze the actual cost of every important or unusual job; (7) to compare with the estimated cost the actual cost of every job, explaining increases or decreases in cost; and (8) last but not least, to have everyone, from president to office boy, vitally interested in total, comparative and unit costs, so that everyone who has anything to do with the work of construction or maintenance will be fully posted as to all phases of the work. The whole staff should literally eat costs, drink costs, sleep costs and even go so far as to dream costs.

A SIMPLE FORM OF "WORK ORDER"

The "authority for expenditure" or "work order" (referred to hereafter by the initials "A.f.E.") should preferably be typewritten in the office of the chief engineer or engineer of maintenance of way, on very thin bond paper blanks, standard letter size, so that nine legible copies can be made. The ordinary form might read about as follows:

NORTH & SOUTH STREET RAILWAY COMPANY

Easton, March 11, 1917.

A. f. E. No........ City....... Div....... For $.......

The President:

Authority for expenditure is requested to reconstruct 10,000 linear feet double track on Washington Avenue from Jones Street to Myers Street in the following manner. Remove 92-lb. 9-in. girder rail and cobblestone pavement and replace with 132-lb. 9-in. girder rail on chestnut ties and broken stone ballast, granite block pavement, grouted joints, as per detailed estimate and blueprint attached.

Reason

To replace worn-out rail and to comply with Order No. 27 of Public Service Commission.

Note—On 1917 Budget.

Approved by

........Chief Engineer ....Gen'l Mgr. ....Pres.

A complete detailed estimate and blueprints of proposed work are attached and made a part of the "A.f.E." It is desirable to separate the estimate into general headings of "material" and "labor" for each class of work, such as track, bridges, buildings, etc., and further it is found desirable to show the exact quantities of each class of material needed and the labor in considerable detail. This may seem unnecessary as the general officers do not care to know the number of spikes or track bolts, but others ought to know these details and it later saves making up a bill of material when requisitions are prepared and also helps the auditor and assistant engineer in checking the cost when the work is completed. The writer is a firm believer in the making up of complete detailed estimates as an aid to cost cutting and to avoid errors and duplication of office work. It is a fact that the reputations of many engineers have suffered from their neglect or lack of ability to prepare close and accurate estimates of cost. With reliable estimates to work from contracts may be let at more satisfactory prices and company work can be more satisfactorily arranged. The making of estimates requires science, art and prophecy—science to grasp the engineering features, art to apply constructive imagination sufficient to see the work as it will be carried out, and the vision of a prophet.

When the late James J. Hill was president of the Great Northern Railway, with which the writer spent fifteen years, the engineering department prepared its estimates so carefully that the total of the estimated costs of construction and reconstruction as compared with actual costs differed less than 2 per cent per year. On that road an effort was made to keep estimates slightly below actual costs. This served to keep everyone "on the jump" in an effort to lower costs to the minimum. The Great Northern's operating ratio was remarkably low, with correspondingly low construction costs.

THE OPERATION OF THE "A.F.E." SYSTEM

The blueprints, attached to each copy of the "A.f.E." should show the location and extent of the work and should give only enough details to show in outline what is to be done and the location of the work. The usual method is to show this in colors on right-of-way, property or mileage maps. This coloring can ordinarily be done by the office boy after one copy is made by a draftsman.

On the approval of an "A.f.E." one copy is retained by the president or the manager, whose office assigns the number and sends copies as follows: Three to the chief engineer, who files one, and sends one each to the roadmaster and the assistant engineer; one to the general superintendent; one to the division superintendent; one to the comptroller, and two to the auditor, who files one and sends one to the outside auditor. This accounts for the nine copies.

The chief engineer's office (or the assistant engineer's, depending on the office organization) makes requisition for material direct from the "A.f.E.," sending copies to the storeroom, purchasing agent, assistant engineer and roadmaster, and also writes a letter of instruction, sending copies to the auditor, general superintendent and division superintendent, assistant engineer and roadmaster. This letter describes how and when the work is to be done, what equipment is assigned to the work, the importance of hurrying, if any, what work will be done by company forces and what contracted for, how the operating department will handle traffic, etc. The general superintendent and division superintendent may then learn what is expected of their departments, can make all arrangements well ahead of the time of starting, and are given an opportunity to suggest changes if the engineering department's plans do not fit in well with operating or traffic requirements. The auditor has an opportunity to size up the work and to get out a letter of instructions as to any special accounts. Sometimes the auditor requires the estimate attached to the "A.f.E." to be divided as to maintenance and additions and betterments, so that he can place on his books approximate maintenance, and additions and betterment charges and avoid making large transfers of charges in his books when the work is finished and all charges are in. The roadmaster has a similar opportunity to perfect all of his arrangements and see that they agree with all conditions imposed.

"A.F.E." WORKS FOR EFFICIENCY

When the material is on hand and the work is organized and started, the word "cost" should be ever in the minds of the men in direct charge. The writer does not mean that the safety of the public or employees or the quality of the work is to be neglected, but rather that engineers, roadmasters and foremen should be made to realize that their reputations and the reputation of the engineering department depend just as much on keeping down the costs as on the quality of the work.

Immediately upon approval of the "A.f.E." it should be entered upon the next regular status report. The writer has found that status reports are desirable each ten days during the working season, dropping to thirty-day intervals during the winter. On the status reports the following information is suggested, varying with the kind of work, the reports to be abbreviated as much as possible: "A.f.E." number, date approved, date started, town or city, location, brief description of work, requisition numbers, note as to progress of delivery, progress of work, percentage completed, and any other data relative to the delays, causes, etc., and, finally, the date of completion.

Sample

A.f.E. 2792—10,000′ Do. Tr. Wash. Ave., Easton. Approved 5/11/16—Matl. ordered Reqns. 1016, 1092, 1217—None rec'd—Work started 6/1/16—av. 30 men—Grading 90% done—Work will be com. 20 days after mat'l is rec'd.

A.f.E. 2793—Commercial Dock—C St., Weston—App'd 5/13/16—Piling contract let to Jones Co.—Superstructure let to Smith Co.—Delayed waiting delivery of piles —All Company mat'l ordered—Reqns. 1130, 1131, 1132—None rec'd.

A.f.E. 2794—Moving partition Gen'l Office—Work com. 6/1/16.

These status reports, if made carefully by one familiar with the work, serve as a running history of each job. They should be sent to the manager, general superintendent, division superintendent, chief engineer, auditor and roadmaster. The head of each department knows that any delays or other causes of increased cost due to himself or any of his men appear in these reports, and the writer knows from his experience that they act as a wonderful tonic in causing the storekeeper and the purchasing agent to hurry delayed material, the superintendent of motive power to speed up delayed work equipment, the general superintendent and division superintendent to give the engineer or roadmaster every assistance in their power, and the engineering department to keep things moving.

STATEMENT AT COMPLETION OF WORK

After the work is completed and all charges are in, the auditor should prepare and send a detailed "statement of charges" to the chief engineer. This statement should be carefully studied for errors in charging labor and material, and a close analysis should be made of a comparison with the cost as estimated in the "A.f.E." Full explanations should cover the increases and decreases in cost of all essential items. The roadmaster should be advised as to these results and complimented when excellent results are obtained, and vice versa. In fact, everyone who is responsible for results in any degree should be made to realize during the progress of the work that the cost figures would at some time be held against him. These cost analyses and comparisons are of the greatest value in the office, especially to the chief engineer, office engineer and estimate clerk, or whoever prepared the original estimate.

All this may sound long and laborious, but the writer has handled from one to a dozen of these "A.f.E.'s" a day as a part of his regular duties in charge of work, and instead of finding it a burden he always considered the scheme a wonderful help, and there is no doubt but that it was a great aid in pushing work along smoothly and cheaply.

THE MISUSE OF MAINTENANCE AND BETTERMENT ACCOUNTS

In order to make partial checks on the cost of the work during its progress, the roadmaster's office should prepare and forward statements, at convenient but frequent intervals, of the total labor expended to date on each job. The roadmaster's office, and especially the timekeeper or time clerk, should have concise and definite instructions on how to make charges among the various Interstate Commerce Commissions' accounting classifications. The writer has found great variation between different roads and also between time clerks of the same road as to the dividing lines between grading, road and track labor, ballast, etc., so that several I.C.C. accounts on one division were not comparable with those on another division for exactly similar work. This resulted in making cost analysis impossible and frequently in raising maintenance charges and lowering betterment charges. It also sometimes happens that maintenance charges on other parts of the line are accidentally or deliberately placed in the accounts as betterments. This is, of course, wrong, and under the I.C.C. laws is likely to cause trouble. Close analysis of costs after work is completed easily brings these to light, and quite often many other strange and startling things.

USE OF OLD MATERIAL CUTS COSTS

In the preparing of estimates it is advisable to have a loose-leaf price list at hand. This is ordinarily furnished by the storekeeper or purchasing agent and should show prices at which all storeroom material is to be charged until the sheet is superseded by a revised one. The storekeeper or purchasing agent should give prices for rail, fastenings, switch material, bonds, ties, lumber, etc., so that the estimator may know that the same prices will be charged on the books for the material actually used. The estimator should also have a list of material on hand at all the stores—usually the storekeeper's monthly or quarterly inventory of material on hand will do—and should know the amounts and location of second-hand material on hand. In fact, he should be kept posted as to the whole new and second-hand material situation on the entire system so as to be ready to use anything available. It frequently happens that the hauling of new material from store or from another division yard to a job could have been avoided by using second-hand material or usable scrap already on hand. Of course, this all involves the office labor of keeping such lists up to date, but with the present price of material a little office work is a cheap way of making a big saving.

The Scope of the "A.F.E."

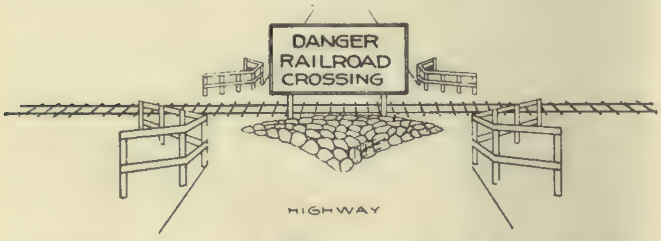
The writer believes that the more important jobs involving maintenance only can be more easily handled by "A.f.E.'s." However, the ordinary run of track, bridge or building maintenance should not be handled by "A.f.E.'s," but if a pile bridge is to be replaced in kind or a long section of track relaid and ballasted with equal rail weight and similar kind of ballast the whole account can be more easily handled all the way through by the system outlined.

The filing of all correspondence, requisitions, etc., with the "A.f.E.'s" is found to be a simple way of handling the files. Keeping of the "A.f.E." index and proper cross-references naturally becomes necessary.

Solving the Grade Crossing Problem

California Commission Considers the Reduction of Vehicle Speeds with Highway Obstructions and Other Methods

THE California Railroad Commission has been conducting an investigation with a view to decreasing grade crossing accidents in that State. Inspections of more than 2000 crossings have been made, 1600 of which inspections have been covered by reports sent to the interested parties. In these reports a total of 1100 recommendations have been made varying in importance from the removal of brush to the elimination of the crossing by closing the street or the separation of grades. The railroads and property owners have cooperated by removing obstructions to view in the vicinity of crossings, and in some cases this work has been done in advance of the commission's surveys.



SUGGESTED PLAN TO COMPEL CAUTION AT GRADE CROSSINGS

Among crossing protective devices the automatic flagman is regarded by the commission to be the most efficient. Sixty-six of these have been recommended to replace the ordinary crossing signs and bells. The publicity given to this general subject has brought forth many suggestions as to devices more effective than those now available. It is considered best to locate such devices in the middle of the highway whenever possible. With the aid of one of the railroads an automatic flagman has been located in the center of a city street, the first installation of its kind in the United States so far as known. If automobile traffic alone were to be considered, this location would be proper without question, but the lights used on horse-drawn vehicles are not adequate to indicate the presence of these devices, so power must be available to light them.

At the general hearings held by the commission last March, a method of protecting grade crossings by compelling low speed on account of physical obstructions placed in the way of vehicles was much discussed. Several different plans of this sort were suggested, six of which somewhat revised were sent to the railroads, the larger cities and some counties with a request for criticism, and with the suggestion that an experimental installation be made when any of the plans could be followed to advantage. One of these plans suggested a change in the profile of the road; three specified parkways, either in the center of the crossing or on each side, to divert the course of the vehicles, and one embodied an offset in the center line of the road which would require a vehicle to make two turns through 90 deg. before reaching the track. The accompanying illustration shows an obstruction proposed for each side of the track with a large danger sign to be 7 ft. above the ground.

The design which was submitted by City Engineer O'Shaughnessy of San Francisco was considered to be probably the best. In this plan the profile of the road is slightly broken about 400 ft. from the crossing; 25 ft. from this break an approach warning sign is located on the right side of the road looking toward the track; about 50 ft. from the crossing a flagman device and crossing sign are placed in the center of the road, and the road is widened to provide for the guard fence which surrounds them. Immediately beyond this fence is an accentuated break in the road profile.

Grade crossing accident reports and investigations bear out the belief that most of the accidents are caused by carelessness. The only way to eliminate accidents of this class, in the opinion of the commission, is to eliminate the crossing. Any expedient but grade separation is more or less temporary.

Home-Made Traffic Sign at Worcester, Mass.

A convenient illuminated sign for controlling traffic at intersecting streets has recently been developed at Worcester, Mass., by George H. Hill, chief of police. As shown in the accompanying photograph, the sign consists of a square transparency mounted about 13 ft. above the street level and carried on a pipe stand which can be turned according to the direction in which traffic is permitted. The transparency is provided with red and green windows for the "stop" and "go" indications, and is illuminated by five 23-watt railway type tungsten incandescent lamps with frosted tips, the lamps being supplied with current from the trolley wire above. The connection is made through a porcelain fuse block mounted on a thin wooden spreader, and a snap switch within reach of the traffic officer. There is a secondary "stop" and "go" sign on the same pipe stand and about 6 ft. above the street level, where it can easily be read by pedestrians. The lettering on this sign is vertical.

HOME-MADE ILLUMINATED TRAFFIC SIGN

Commissions Know Costs Are High

Canvass by Banking House Shows That Commissions Appreciate Present Operating Conditions—Regulatory Bodies Rather Anticipate Formal Application for Relief

As an investment banking house dealing exclusively in the securities of utility corporations, the firm of John Nickerson, Jr., New York, Boston and St. Louis, has been questioned by investors as to just what the attitude of public service commissions is going to be with reference to increases in rates to meet higher operating costs. In order to get this information at first hand, the company recently sent a letter to the presiding officer of every commission in the United States, asking whether the matter of increased rates had been brought before his regulatory body, and what its attitude had been or was likely to be.

Replies have been received from practically all the commissions. From a summary of these prepared by the bankers, it appears that while not many cases involving the question of the need of increased revenues have been presented, yet the commissions recognize the abnormal situation which exists in regard to the increased costs of material and labor. In many cases they indicate that these new conditions will receive consideration in the event of application being made for authority to increase rates.

SOME REPLIES ARE NON-COMMITTAL

In a number of instances the blunt statement is made that no cases involving the question have been before the commission. Some commissions, however, while stating that there has not been a case before them in which rate increases were sought to offset higher costs, go a step farther and point out that they do not feel that they can or should commit themselves in advance as to future action.

In some states the act creating the commission does not give it jurisdiction over rates, except upon complaint. In these states the matter of increasing the rates is rather "up to the company," and in one of the letters the commission makes the point that thus far it has issued no orders lowering company-made rates.

A few of the commissioners in their replies point out that operating costs enter into the determination of rates and are a matter of vital importance in such a consideration. One commissioner writes as follows:

"We are continually dealing with the matter of valuation of public service corporations and the fixing of rates. Necessarily operating costs, as they exist, are a vital consideration. We have had no application from public service corporations to increase rates due to alleged increased cost of operation, and I am not able to say what the attitude of the commission would be in that connection."

NUMBER OF COMMISSIONS AWARE OF ABNORMAL CONDITIONS

A number of the commissioners, while stating that no formal application had been made for increased rates, point out that the commmissions are aware of the existence of abnormal conditions and rather strongly imply that these matters will receive serious consideration when the question is brought formally to their attention. One commissioner says:

"While I appreciate the considerations which have prompted your inquiry, I am not able at this moment to give you a categorical answer. Mindful of existing conditions, we are anticipating that the general question probably will be brought formally to our attention, but no application of the sort, thus far, has actually been presented to us otherwise than in occasional isolated cases which have not been based upon anything outside of the ordinary. Each particular case would, of course, be decided upon its individual merit. Even if it should be established that increased cost of operation is universal, it nevertheless might occur, in individual cases, that economy in operation and postponement of all such extensions and betterments as would not involve any question of safety in operation or impair measurably efficient service, properly might be relied on to offset, to some extent at least, the increased burden under consideration."

Another commissioner puts it this way:

"I think, upon reflection, you will see that you have asked a question which cannot properly be answered, save with respect to specific cases as they arise. At the same time you may be assured that the members of this board are fully alive to the present abnormal conditions and the increasing cost of oil and coal, as well as other expenses with which the managers of the public service corporations are confronted."

In another instance reference is made, without citing specific cases, to the fact that the matter has received consideration in recent cases, and the following statement is made:

"We beg to advise that the commission did not forget, when making decisions in rate cases, that there has been a very material advance in the expense of performing service. We endeavor, as best we can and with as little friction as possible, to cause the claimant or petitioner, as the case may be, asking for a reduction in the rate, to understand these conditions. We think it must be a matter of general knowledge."

ONE COMMISSION WILL ACT FEARLESSLY, SQUARELY AND EXPEDITIOUSLY

A letter from a member of another commission indicates that the subject has been informally discussed by the commission with a view, apparently, of formulating a policy to be pursued in connection with rate-increase applications when presented. It states:

"This matter has been talked over with my associates and the conclusion is that this commission is going to do its duty fearlessly. It is not in the habit of giving out in advance what any of its decisions are going to be, but you can rest assured that whenever matters of this nature are presented to us, they will be dealt with squarely and expeditiously."

CASES DECIDED SHOW CONSIDERATION OF UTILITY NEED

There have been a few cases before the commissions, the bankers say, and in these a strong inclination has been shown to give the question careful consideration. In some instances increases in rates have been allowed. The chairman of a very prominent Western commission writes:

"In response to your question regarding the need for increased rates, I would say that this matter is now before the commission in one or two cases. Without indicating what the commission's decision will be in those cases, I would simply say that this commission will do whatever any fair-minded man would do on the testimony in these cases."

In a letter written by one of the commissioners of one of the oldest and probably ablest commissions in the United States, it is stated that the question of increasing rates to meet the increased costs has been before that regulating body. This commissioner says:

"Before any increase in rates is approved by this commission, the cost of the service, the physical value of the property and all other items usually used to determine what a reasonable and just rate should be, always receive careful consideration. We have approved many increases on showings made that the cost of the service had increased due to increased cost of material and labor, and while I would not care to speak for any future action of the commission, I take it that any action which does not consider the increased cost of material and labor will not be taken by this commission."

GENERAL INCREASE IN RATES ANTICIPATED

This same commissioner points out that it must always be determined whether the increased costs are temporary or reasonably permanent. He mentions the fact that in some instances this condition was written into the order authorizing the increase, *i.e.*, that when costs returned to normal an application for a reduction of the rate would be in order. He then sums up the whole situation in this way:

"I see no good reason why there should not be, and I anticipate that there will be, a general increase in rates for all service furnished by public utilities due to the increased cost, unless all signs fail and prices of labor and material drop to the scale obtaining several years ago."

FAVORABLE DECISION OF WISCONSIN COMMISSION

The Wisconsin Railroad Commission had before it, in the application of the Village of Cambria, as a gas utility, for authority to increase rates, the question of allowing an increase due to the increased cost of gasoline. In disposing of this case on Jan. 24, 1917, the commission said:

"From the information which we have at hand, it would seem that the cost of commercial service is rather high. An upward revision in the rates will not be inequitable, however, when we consider that at the present and even at the proposed price of gas to private consumers, either a considerable part of the actual cost of the gas must be charged against the street lighting, or the deficit must be borne by the general taxpayer, which amounts to the same thing, since the village receives no other benefit from the plant. Taking all the facts into consideration, it seems to us that the utility is entitled to an increase in its rates in order to enable it to give the proper service without unduly burdening the general taxpayer."

Here was an instance where the commission recognized the fact that the burden of the increased cost of operation should not be borne entirely by a few for the benefit of all consumers.

NEW YORK COMMISSION REALIZES COSTS ARE HIGH

Referring to high operating costs, an opinion of a member of the Public Service Commission for the First District of New York in a recent lighting rate case is cited as follows:

"In view of the unsettled economic conditions arising out of the state of war, the increases in the cost of production and distribution which have taken place within the last two years, and which are likely to continue, together with the wider recognition of labor and greater remuneration and improved working conditions enhancing costs to the company, the effect of a reduction in the rates upon the company's operations must be problematical. Certainly at this juncture the commission would not be justified in making a drastic order which would disturb the company's stability."

In a still more recent case, decided on April 26, 1917, this same commissioner says:

"Nor will the normal increase of business combined with the increase in consumption which usually follows a reduction in rate justify a finding that the effective rates are excessive. The operating figures for 1915 do not take into account the increases in the cost of labor and materials which have taken place during 1916 and 1917, which may be augmented as a result of the national exigencies arising out of the war with Germany. While it would be unjust to permit a utility to exact demonstrably excessive rates from consumers in order to transfer the burden of the taxation which must be borne as the material sacrifice in support of the contest by arms, yet in times of unsettled conditions the margin of safety necessary for the stability of public utilities should not be curtailed."

CONCLUSION REACHED BY BANKERS

This summary of the replies, it is stated by the bankers, is indicative of the fair-minded tone which characterizes them. In the bankers' opinion, the following facts seem to stand out very prominently:

1. The question of securing increased revenues to cover higher operating expense has not been generally presented to the commissions.
2. A large number of the commissions have given the matter some informal consideration and rather anticipate that the matter will be brought very shortly to their attention in a formal way.
3. In most cases in which the question has been presented, a spirit of appreciation of the conditions confronting the public utilities has been shown, and a desire indicated to maintain the stability of margin of safety of public utility securities.

An Improvised Electric Locomotive

The Northwestern Lumber Company at Hoquiam, Wash., is completing the logging of a tract of land practically within the city limits. To facilitate getting the logs to the mill the company built an electric railway line into timber, and the logs are being hauled out by an electric car owned and operated by the Gray's Harbor Railway & Light Company. This is the standard car of the company except that the motor capacity has been increased from 160 to 240 hp. The logging company's private electric line connects with the Gray's Harbor

ELECTRIC LOGGING TRAIN, HOQUIAM, WASH.

interurban at Electric Park, and the logging trains coming out over the private lines of the park continue over the main lines to the Hoquiam River, where a spur and log dump is built opposite the Northwestern mill. P. A. Bertrand, general manager of the railway company, states that from six to seven loads of logs per train are easily handled, and that during the last four years approximately 8311 carloads, totaling 61,197,000 ft., have been handled.

Electric Railways Must Have Greater Revenue

The Author Considers an Advance of 20 Per Cent in Fare to Be Moderate as Compared with Increased Costs in Other Lines

BY JOSEPH K. CHOATE
Vice-President J. G. White Management Corporation, New York City

THE question of operating costs has become a very serious one with everybody, and particularly with those interested in traction service. The tremendous increases that have arisen in the cost of labor and material, ranging from 40 to 125 per cent, have had to be faced with rates of fare which were originally based upon the nickel. The nickel was adopted years ago as the unit of fare on all city traction lines at a time when 5 cents bought more than can be bought for 10 cents to-day. Only the advances in the art and efficiency of administration have enabled the traction lines to exist and to continue their work, even before the present conditions brought about by the war came into existence. The increases in the cost of labor and material have been steadily met for a great many years previous to this time.

WHY ELECTRIC RAILWAYS NEED RELIEF

In addition to the greatly increased cost of labor, there has been also the competition with which our companies have been faced, particularly from the automobile. The United States census returns, made public soon after the first of January this year, showed that there were 2,500,000 automobiles in the country. With an average seating capacity of five to an automobile these have a total seating capacity of six times that of all the traction lines in the country, and two and one-half times more than all the railway lines combined, steam, electric and otherwise.

During the year 1916 the railways of the United States paid $152,000,000 in taxes. A large part of this amount has been devoted to the improvement of highways, generally along the lines of traction companies, and thus has added to the competition and to the burden that the traction lines have had to bear. In addition to this, due to old and obsolete laws, a species of graft has existed in cities and municipalities in the matter of paving. The requirement regarding paving first existed within the city limits, but has been extended to the state highways. This requirement has been met, but not only has it imposed a great burden upon the railways in the matter of costs, but it has produced a system of legal graft.

When horse cars were in use the pavements of cities were destroyed by the action of the horses traveling over the pavement always in the same place. To-day, however, a double-track electric line occupies but 10 in. of the street width, and a single-track line but 5 in., that is, merely the width of the rails. There is no wear upon the pavement whatsoever. On the other hand, the railway company, by keeping the tracks clear of snow and encumbrances of all kinds, invites traffic of every description—automobiles, trucks, etc.—to its lines. All of these things should be taken into consideration in connection with our claim for additional remuneration for the service which we render.

We are also met at this time by the possible future requirements of the traction lines in connection with their operation for the benefit of the government. While at present this may not be of any great moment it may, before this war is finished, be of the very greatest importance in the part the traction service may be called upon to perform in connection with government requirements. I am positive that the government of the United States will find no more loyal or patriotic men than those who are interested in the ownership or operation of the traction lines.

HOW SHALL WE OBTAIN THE DESIRED RELIEF?

The question which now arises is how best to appeal for an increase in the charges for our service, in the return we should receive for it. The argument has been made that the distance tariff offers the best means of doing it. Without a doubt a distance tariff, as applied in European cities, should have been applied in this country. This would have provided a much fairer way of paying for the service which we now give, but at present it would be unwise to ask the commissions to permit us to put a distance tariff into effect. Most of our traction lines, including interurban lines, have made it a prominent part of their policy and progress to extend their lines into outlying districts which offered attractive living conditions for people of moderate means, through low rentals and prices for necessities. If now a distance tariff were to be applied, the burden would be placed on the very people who have been attracted into these outlying districts by the traction lines.

The situation that will arise in presenting this matter through the efforts of the traction lines to the commissions will be met, possibly, by the desire of the commissions to go into the question of valuation. It is to be hoped that the commissions will not require at this time the making of detailed valuations, as it would require so much time to complete them that all hope of relief of the present situation would be deferred for years. However, some form of approximate valuation can be arrived at, if it is deemed essential that valuations should be made.

We start, in the first place, on the premise that for years 5 cents has been the general rate of fare throughout the United States. In a few places special laws have required 3-cent fares, which impose an additional charge for transfer privileges and other features of service which are generally given by traction lines. In these cases, therefore, the rate per capita to railways operating on the 3-cent basis has been as great as with the 5-cent rate in cities where transfers and other privileges are given gratis. The time has now arrived, in my opinion, when there should be an increase in our rates of fare commensurate with the increases that have occurred in the cost of every commodity that forms part of the necessities of life. These run anywhere from 40 per cent to 200 per cent, while we have had no increase. This, I think, is the justification for any application that we may make at this time. An increase in fare from 5 to 6 cents will mean increase in revenue of approximately 20 per cent, a moderate advance in view of the very great increases enumerated, and of the increase in prices which we have to pay for every commodity that enters into the cost of our service.

It should also be borne in mind that the increase of 20 per cent to the railway company is, in terms of the patron's income, a very small percentage. Let us take, for example, the lowest paid wage earner, the laborer, who earns, say, $2 a day. In the 300 working days of the year he earns $600. If he travels on the cars to and from his work the increase in his expenses is 2 cents a day, or $6 a year. That is 1 per cent of his income required for the added cost of transportation. This percentage is less as the income of the individual is greater than the amount cited.

Franchise Limitations Are Not Insuperable

There is also another question which will arise in going before the commissions, namely, that of franchise conditions. In the inception of many of our lines the promoters were willing to accept franchises which limited the rate of fare to 5 cents, particularly within the city limits. Now my own opinion is that most communities recognize that one of the greatest factors in the prosperity of any city or village are prosperous, well-operated traction lines. I believe, therefore, that if this point is forcibly presented, municipalities, as a rule, will not be very strong in their opposition to an increase above the franchise rates.

There have been decisions in the State of New York, and I think in some other states as well, in which the courts indicated that utility commissions have a right, under certain conditions, to allow greater than franchise rates. I feel sure, therefore, that if the proposition is presented fairly and squarely to the commissions themselves there will be no very serious obstacle to overcome in order to get some relief.

It is my feeling that the action of all the traction lines as a unit at this time is most desirable; not that they are in any sense to be combined in restraint of trade, but because the representation of the traction lines as a unit will eliminate the possibility of one community being subjected to an increase in rates when another is not. All communities will be made to feel that they have been treated fairly and uniformly.

Railways in New York State Asking for More Revenue

The electric railways of New York State have at work a special committee on ways and means for obtaining additional revenues, of which the writer is chairman. This committee is acting as a unit and has already held conferences with the two commissions in the State, as was noted in last week's issue of the Electric Railway Journal. I believe that by having this committee appear as a unit, representing all the traction lines of the State, it will have a very decided effect upon the commissions themselves and thus relieve them from having one community arrayed in criticism against another. While acting as a unit, this committee is composed of two divisions, one for Greater New York and the other representing the railways in the rest of the State. This is necessary because the conditions and requirements in the two cases are so different. For example, the railways of Greater New York are not now petitioning directly for an increase in their rate of fare, but rather are asking permission to make a charge for transfers, for the reason that the surface lines in that city have as a competitor the subways and elevated lines, in the ownership of which the city is a partner. The "up-State" lines, on the other hand, will probably find it advisable to petition for direct increases in rate of fare.

By working according to the program outlined above we are going to overcome the objections which may be brought forward, and the necessity for the commissions to make examinations of our books to see what returns have been made upon the money invested. Certainly the traction lines of this State do not return any great amount on the investment, and if one will investigate the prices of traction lines in general he will find that no one wishes to buy them under present conditions, as the returns therefrom are not at this time sufficient to meet the demands.

Higher Fares Must Come

United action on the part of the railways in this and other states is our salvation, and I feel that if we present our cases to the commissions in a fair and straightforward way they will seek ways and means to give us a helping hand in this direction. From conversations with members of the commissions of this and other states I am convinced that at heart they have the feeling that increased revenue must be provided to avoid disastrous results. I am also convinced that the action taken by the electric railways in New York State at this time will have a far-reaching influence in all sections of the United States.

What the California Association Has Done*

BY W. V. HILL, MANAGER

THE California Electric Railway Association, consisting of twenty-four electric railways and three steam line railways operating electric units, was organized on May 1, 1916, for the purposes of conducting co-operative work for the welfare of its members, promoting good relations with the public, and the advocating of intelligent legislation, both State and municipal, affecting the interests of the electric railways in California.

While the association has been instrumental in bringing together the various officials of the electric railways, thus enabling them to exchange views on important subjects of common interest to all, these meetings should have been more frequent. There should be a better understanding and closer co-operation among the members.

The association has conducted a very satisfactory publicity campaign in newspapers and periodicals throughout the State. There has been very little adverse criticism appearing in any of the publications recently. The association as an association cannot claim full credit for this changed sentiment, as the public utterances made by several of its members and the educational work carried on by the several member companies through the medium of their magazines have been largely responsible for this satisfactory state of affairs.

Legislation

The association did what it could in connection with the Adamson eight-hour bill and the Cullop bill in explaining to the California representatives in Congress the reasons why electric railways should not be included in the provisions of those bills, and while other electric railway associations as well as companies and individuals also may have protested, the activity of the California association had its effect. The association has also presented data in Washington upon the importance of proper compensation from the government to electric railways for transporting mail.

In State, county and municipal matters, the association has been of especial help in supplying information to authorities and others in regard to jitney competition. The association also obtained from the Supreme Court a decision that the Railroad Commission has a certain amount of jurisdiction over those jitneys which operate in interurban service on regular routes and schedules. Under this authority the association has petitioned the Railroad Commission to make an investigation of the jitney question in the State and also the franchise laws under which the electric lines operate. The commission has investigated the jitney problem but as yet has given little time to the franchise question.

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*Abstracted from first annual report prepared for meeting of association at San Francisco, May 7.

Statistics showing the type and cost of paving have also been gathered and sent to all the members. Considerable thought has been given to safety measures, grade crossings, etc., and opinions on the effect of jitney competition on the value and sale of securities have been obtained from a number of Eastern bond houses which handle the securities of the electric railway utilities in the State of California.

New York City Lines Ask Two-Cent Transfers

Formal Applications for Relief Were Filed with the Public Service Commission, First District, This Week by the New York Railways, the Brooklyn Rapid Transit Company and the New York & Queens County Railway

PART of the inevitable has come to pass. On May 23 formal applications for authority to charge 2 cents for first transfers were filed with the Public Service Commission for the First District of New York by all the street railways in New York City, with the exception of the Third Avenue Railway and the Second Avenue Railroad. The latter company, as well as the companies coming under the jurisdiction of the Second District Commission, is expected to follow suit in a few days. As this issue was going to press, application for relief was made by the Third Avenue Railway.

The applications submitted for the New York Railways, the Brooklyn Rapid Transit Company and the New York & Queens County Railway all stated the imperative need of increased revenues in order to enable the companies to meet the high costs of operation and pay a fair return upon the investment. They were turned over to commission counsel, who will outline a method for further procedure by the commission.

B. R. T. ASKS MODIFICATION OF TRANSFER ORDER

The formal application presented by the Brooklyn Rapid Transit Company for its allied surface lines asked for a modification of the March 17, 1914, transfer order of the commission. While the company proposes to maintain the basic principle of 5 cents for a continuous ride between residence and business sections, it desires to curtail the excessive use of transfers by charging a small amount on them except in the case of certain feeder lines.

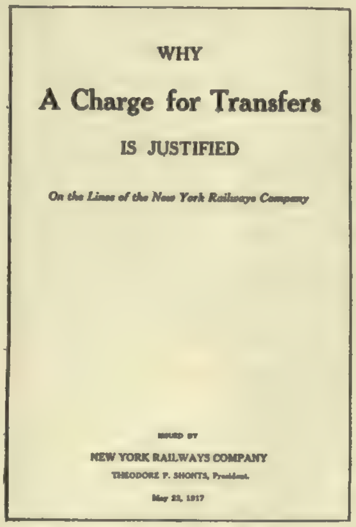
A statement accompanying the applications says:

"Under the commission's 1914 order transfer passengers are increasing 8,000,000 a year, and cash passengers are barely increasing at all. During the three fiscal years preceding July 1, 1914, the average annual increase in passenger revenue was $634,796. During the three years following, the average annual increase has been only $119,826, an average yearly decrease in growth of $514,970. The average fare received per passenger in 1913 was 3.82 cents, while in 1916 it was 3.28 cents.

"We realize that the new subway and elevated railroad facilities have diverted some traffic from the street railways, but any accountable diversion due to this cause does not explain the comparatively great loss in street railway revenue since the present transfer order went into effect. As cash passengers relatively diminish, the transfers which they use would be expected to diminish proportionately. That they have increased so enormously is proof conclusive that they have supplanted cash fares—either by more extended use of the privilege or by more fraudulent use of the transfer ticket.

INCREASED COSTS FOR B. R. T.

"On the entire Brooklyn Rapid Transit system during the calendar year 1916, as compared with the preceding year (when costs were also high), transportation wages cost $659,000 more, power $243,000 more, maintenance $182,390 more and taxes $533,062 more. Of the important railway supplies the increase in prices in 1917 over 1915 has ranged from 26 per cent to 400 per cent. The price of the product—transportation—has actually been going down, measured by the unit of fare per passenger, while the cost to us of that product has been rising. Such a tendency is neither just nor wholesome.


WHY

A Charge for Transfers

IS JUSTIFIED

On the Lines of the New York Railways Company

ISSUED BY

NEW YORK RAILWAYS COMPANY

THEODORE P. SHONTS, President.

May 23, 1917

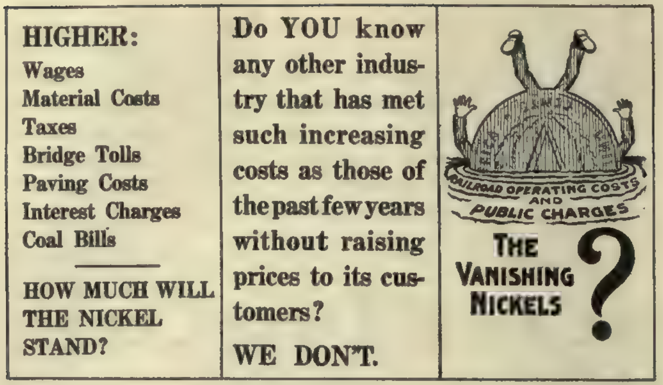
COVER OF NEW YORK RAILWAYS BOOKLET

8 PER CENT IS B. R. T. MINIMUM RATE OF RETURN

"The courts seem generally to have agreed that a rate of return of less than 6 per cent on fair property values is confiscation when forced by official regulation or by legislative act. Measured by that rule of law the present transfer would be declared invalid, if contested. But there is a wide difference between a confiscatory rate and a reasonable rate of return. The former merely protects the investor in the title to his property. The latter protects the public in its reasonable demands for facilities and encourages the investor to supply them. The statutes of New York for sixty years forbade a reduction of rates which would bring the return upon capital expended to less than 10 per cent, and this is not unreasonable. The preponderance of opinion is in favor of a return of from 8 to 10 per cent.

ACTUAL RATE OF RETURN OF B. R. T.

"The gross income for 1916 was less than 5 per cent on the gross assets, including all kinds of property owned. For comparison with what the commission has



HIGHER:
Wages
Material Costs
Taxes
Bridge Tolls
Paving Costs
Interest Charges
Coal Bills

HOW MUCH WILL THE NICKEL STAND?

Do YOU know any other industry that has met such increasing costs as those of the past few years without raising prices to its customers?

WE DON'T.

RAILROAD OPERATING COSTS
AND
PUBLIC CHARGES

THE VANISHING NICKELS ?

OUTSIDE OF CAR PAMPHLET ISSUED BY THE BROOKLYN RAPID TRANSIT COMPANY

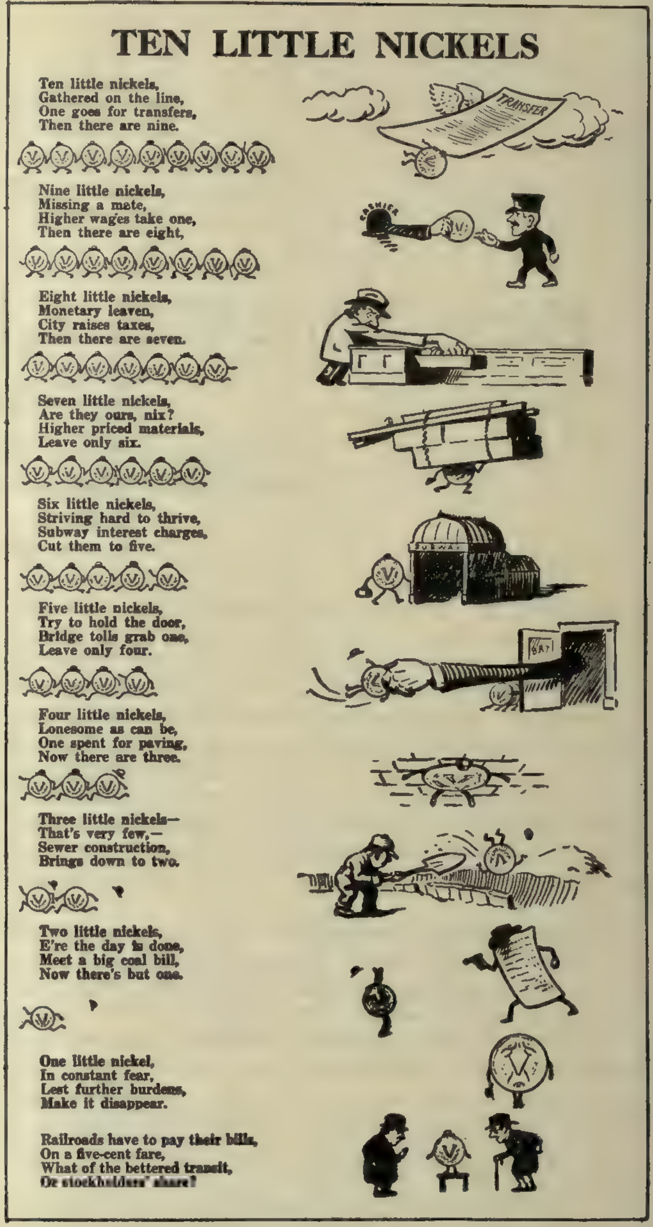
itself approved as to the valuation of our properties, we take as a basis the appraisal of the commission's expert, Bion J. Arnold, in 1909, plus the net additions of property since that date (of which the commission has been fully advised). This result closely approximates our book value less accrued amortization, and the rate of return on the book value in 1916 was only 5.69 per cent. Mr. Arnold's figures covered only the assessed value of real estate and the then present value of tangible property, based upon the cost of reproduction less depreciation. They did not include allowance for easements, real estate values in excess of assessed valuation, interest during construction, franchise values, development expenses, working capital, or preliminary legal and organization expenses, etc.

"As the commission said in its opinion: 'All of these items would be absolutely essential disbursements in the reproduction of any existing railroad, and they would add considerably to the figures of valuation given in the foregoing estimate if proper allowance were made for them.' We have therefore added to the original estimate percentages of costs which Mr. Arnold and other experts have assumed to be fair allowances for omitted items, except franchise values, which we have not attempted to include. Upon this basis the total reproduction value as of January 1, 1909, was $76,990,105, to which have been since added properties valued at $2,718,095—making the total reproduction value as of March 31, 1917, $79,708,200. On this valuation the return for 1916 was only 5.91 per cent. The commission, therefore, has ample information as to the value of our properties, and the return is less than what the courts have held to be confiscatory.

"Out of the total passengers carried only about one-fourth will be affected by the proposed transfer charge. The estimated increase of revenue will not exceed $1,200,000 per year. That addition will still leave our net return less than what by the concurrent opinion of public utility commissions and experts is reasonable and proper."

PETITION OF NEW YORK RAILWAYS

The application made by the New York Railways requested either an abolition of free transfers or an authorization of a charge of 2 cents for each transfer, without extra charge for retransfers. In support of its application the company said that it had never paid a dividend on its capital, nor had its income in any calendar year been sufficient to pay the full 5 per cent interest on the adjustment income bonds. The actual return for the year ended Dec. 31, last, "or true net income from operation," was $2,431,416. This total was obtained, it was explained, by deducting from the gross earnings from all sources only operating expenses and taxes, and without deducting the rents paid for leases, interest on funded debt or other fixed charges.



TEN LITTLE NICKELS

Ten little nickels,
Gathered on the line,
One goes for transfers,
Then there are nine.

Nine little nickels,
Missing a mate,
Higher wages take one,
Then there are eight,

Eight little nickels,
Monetary leaven,
City raises taxes,
Then there are seven.

Seven little nickels,
Are they ours, nix?
Higher priced materials,
Leave only six.

Six little nickels,
Striving hard to thrive,
Subway interest charges,
Cut them to five.

Five little nickels,
Try to hold the door,
Bridge tolls grab one,
Leave only four.

Four little nickels,
Lonesome as can be,
One spent for paving,
Now there are three.

Three little nickels—
That's very few,—
Sewer construction,
Brings down to two.

Two little nickels,
E're the day is done,
Meet a big coal bill,
Now there's but one.

One little nickel,
In constant fear,
Lest further burdens,
Make it disappear.

Railroads have to pay their bills,
On a five-cent fare,
What of the bettered transit,
Or stockholders' share?

INSIDE OF B. R. T. CAR PAMPHLET

For the five years ended Dec. 31, 1916, the average annual return was $3,766,814. If the return had been sufficient to permit payment of interest at the full rate of 5 per cent on the adjustment bonds, the income would have had to be $4,433,323. If it had been sufficient to pay also 6 per cent on the outstanding stock, it would have had to be $5,480,626.

The company said that for the nine months ended March 31, 1917, the net income was insufficient to pay any interest on its adjustment income bonds, and was also insufficient to pay the interest due and to become due upon the outstanding first real estate and refunding 4 per cent mortgage bonds. During the nine months this deficiency amounted to $464,271.

The total number of passengers carried by the system for the year ended Dec. 31, 1916, was 335,752,271. Of this number 15,184,304 were "revenue" transfer passengers, or those for whose transportation the company received some measure of compensation because of joint rate arrangements with other carriers, and 92,466,233 were full transfer passengers. During the four years ended Dec. 31 the average annual total number of passengers carried was 371,266,155. Of these 13,906,081 were revenue transfer passengers and 106,315,339 were free transfer passengers. The average fare received in the last calendar year was 3.53 cents, while for the last four-year period the average was 3.49 cents.

The application stated that the value of the property of the New York Railways devoted to public service is $109,206,000, and that on the basis of the commission's own determination in the Metropolitan Street Railway reorganization, with later additions and betterments, the value is at least $89,000,000. On the latter figure the average annual net income for the five years ended Dec. 31, 1916, is equivalent to a return of 4.23 per cent. The company said it should receive at least 7 per cent and an addition of 1 per cent for surplus and contingencies, and that on the commission's valuation the return should not be less than $7,120,000, or 8 per cent.

OTHER POINTS OF THE WEEK'S ACTIVITIES

The application of the New York & Queens County Railway asked for relief, but did not specify a charge for transfers. It was said that the net investment in road and equipment was $8,427,115. The total operating expenses for the year ended June 30, 1916, were $1,435,764, and there was a deficit for the year of $294,570. During the fiscal year 28,373,608 passengers were carried, and the total number of transfers collected was 8,964,862, making the average fare per passenger 3.80 cents, which is less than the cost of carrying such passenger. Since the opening of the new Astoria and Corona rapid transit lines the loss to the company has increased, the loss up to May 15 being $70,301. The company simply petitions the commission to act in such a manner as to permit it to operate without loss.

During the week the Brooklyn Rapid Transit Company issued a car pamphlet designed to show the public the various burdens upon the nickel fare. This pamphlet is reproduced on page. The New York Railways issued a nineteen-page booklet, as shown in the illustration on page 957, to show why a charge for transfers is justified. Placards were also placed in the cars, asking whether it was not more fair to charge 92,000,000 persons for transfers than 257,000,000 persons a higher unit fare.

A resolution protesting against favorable action by the Public Service Commission on any request for increased fares has been adopted by the Board of Aldermen at the proposal of President Dowling, who urged that "before any authority is given these street railway lines to increase fares or charge for transfers a thorough investigation of the bond and stock issues of not only the holding companies but of the various lines making up these several systems be made by the commission."

N. S. C. Slogan Pamphlet

The National Safety Council has recently issued a pamphlet containing safety slogans. Among those suggested for electric railways are as follows: Stop when you see an officer signaling. Better lose the car than be thrown under it. A trolley car can't guard you to keep out of its way. Take your life current from the trolley of safety. Wait till the car stops and face front when alighting. Main thoroughfares are not intended for playgrounds. Don't lose your head in traffic or you may lose a limb. Unless your head is solid bone, do not put it out of a car window. Wait until the car stops before you step on or off; the car can wait. Before leaving the car look both ways—for wagons, autos and motorcycles. When passing behind a car always look to see what is coming from the opposite direction.

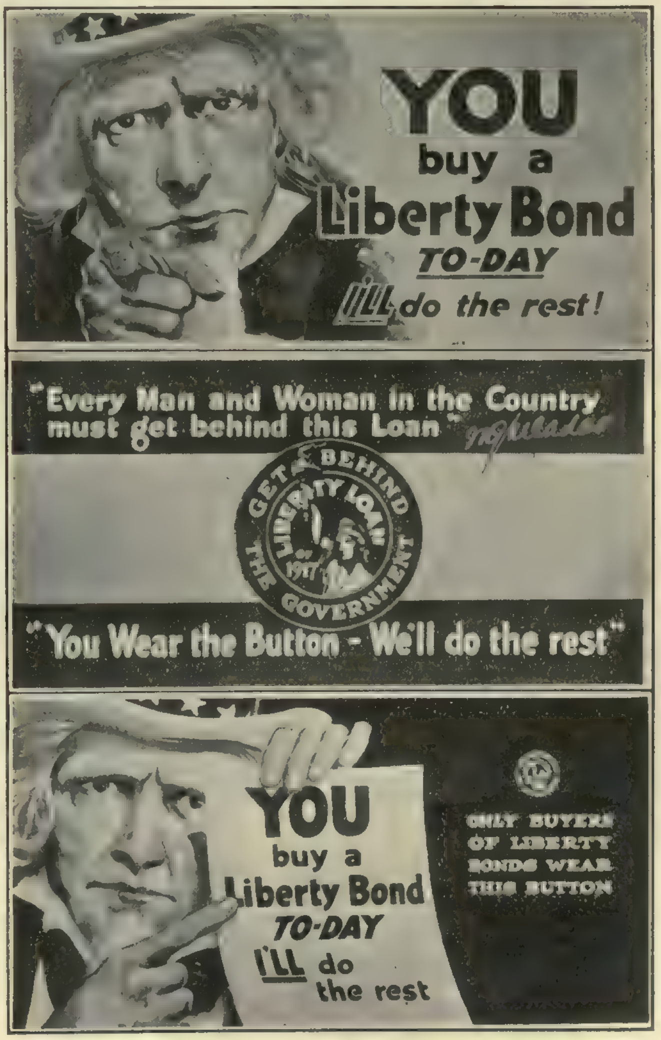
Floating the Liberty Loan

Plans for Selling War Bonds Occupy Attention of Electric Railways—Street Railway Advertising Operators Prepare National Campaign

DURING the past week the most prominent feature of war-time activities of the electric railways appears in their plans for aiding subscribers to the new government bond issue that constitutes the "Liberty Loan." In addition, the electric railway industry is playing an important part in the popular movement for giving wide publicity to the sale of war bonds.

Beginning early next week the merits of the new Liberty bonds will be advertised in some 50,000 electric cars, operating in all sections of the country. Free advertising space in the cars was recently offered to Secretary of the Treasury McAdoo by Barron G. Collier on behalf of the country's street car advertising operators. The cards to be used in this campaign, six in number, are being supplied by the Collier Company and were designed in its art department, in co-operation with Mr. Woolley, director of publicity for the Treasury Department at Washington. Three of the designs are illustrated herewith. As will be seen, they emphasize the patriotic as well as the investment feature of the loan, and liberal use has been made in the design of the button to be issued to purchasers of bonds.

The management of the San Francisco-Oakland Terminal Railways has taken a great interest in this movement, and placards are being displayed in all of the cars and ferry boats operated by this company to call


YOU
buy a
Liberty Bond
TO-DAY
I'LL do the rest!
"Every Man and Woman in the Country must get behind this Loan" McAdoo
GET BEHIND THE LIBERTY LOAN THE GOVERNMENT 1917
"You Wear the Button - We'll do the rest"
YOU
buy a
Liberty Bond
TO-DAY
I'LL do the rest
ONLY BUYERS OF LIBERTY BONDS WEAR THIS BUTTON

ELECTRIC RAILWAYS IN WAR TIME—CARDS DISPLAYED BY ASSOCIATION OF STREET CAR ADVERTISING COMPANIES the attention of the public to the bonds. In the last issue of *Key System News* which is published by this company, it is urged upon all employees their duty is to subscribe to these bonds up to the amount of their ability to do so. Subscription blanks have been placed at all available places for employees and for the public generally, and the management is supervising the entry and delivery in proper form of subscriptions received in this manner.

A number of companies have arranged for sales of the bonds to their employees on installment plans. Among those which have done so is the Bay State Street Railway Company. The leaflet issued by the company descriptive of these bonds says that they will be cared for by the company if the subscriber desires, and the coupons will be collected when they are due, the amount of the coupons being paid to the employees owning the bonds. Attention is called also to the fact that the Amalgamated Association of Street & Electric Railway Employees of America urges its members if possible to subscribe, and there is reproduced a telegram from W. D. Mahon, president of the association, to this effect. The leaflet concludes: "It is an easy thing to cheer the flag, an easy thing to spout patriotic oratory. But the call for this vast amount of money brings to Americans of every class, as individuals, a demand for something that Americans find much harder—personal self-denial. It brings the first concrete opportunity to show whether your patriotic sympathy with the cause of the Allies and the declared purposes of the conflict with the Prussian aristocracy has been only conversation; whether, when the President summoned the American people to the sacrifices and suffering inseparable from war, he really represented you."

As a part of the movement toward the exploitation of the loan in New York State, where it is expected that nearly a billion dollars will be raised, the Interborough Rapid Transit Company has announced arrangements for the purchase of the bonds by its employees on weekly payments of $1, and that free advertising space in all of the company's cars has been offered to the government.

War Notes

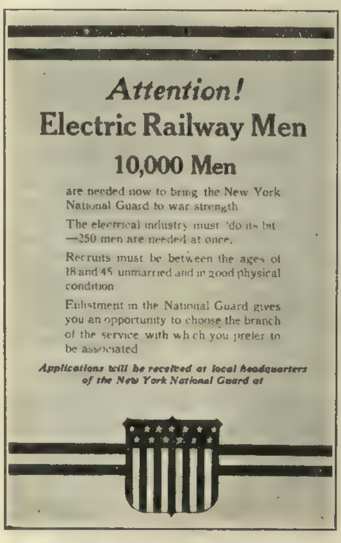
Women Now on the Front Platform in Glasgow—N. Y. E. R. A. Assisting in National Guard Recruiting—Editors Confer with Government Department Heads

At the present time nearly 300 women, formerly employed as conductors, are engaged in operating surface cars on the Glasgow Corporation Tramways—the first railway system in Great Britain to replace large numbers of motormen with women operators, and James Dalrymple, general manager of the system, has appealed to every suitable woman conductor to undergo a course of training in order to release motormen for government service. In the training of women for duty on the front platform, exactly the same course is followed as with men, the arrangement being in the hands of the traffic superintendent, while the instruction is given by an experienced engineer at the company's school for motormen.

The course of instruction extends over a period of twelve days, during which full wages are paid, and it is open to all conductors after a period of satisfactory service as conductor ranging from six to twelve months. The first four days of the course are taken up in oral instruction in connection with a skeleton car in the company's school. For the next four days the beginner is sent out on the road under the care of an experienced motorman who has been specially authorized to instruct students. On the eighth day the beginner goes back to school for a preliminary examination in knowledge of car details and platform duties, and following this the next three days are again spent on the road in regular service under an experienced motorman. The afternoon of the twelfth day is taken up with a final examination that is conducted by the chief instructor at the motormen's school, satisfactory candidates being passed after having certificates forwarded to the head office.

ENLISTMENT POSTER IN NEW YORK

A strong effort is being made by the Citizens' Preparedness Association of New York State to encourage enlistment in the National Guard in accordance with the request of the War Department that the existing organization be recruited to war strength before it is taken into the federal service. The different trades and industries have been listed, and arbitrarily quotas have been assigned to each. That for the electrical industry has been set tentatively at 250. To aid in this movement the New York Electric Railway Association is distributing among the electric railways of the State red, white and blue placards like that shown in the accompanying illustration, these being intended for posting in carhouses and other prominent positions.



Attention!

Electric Railway Men

10,000 Men

are needed now to bring the New York National Guard to war strength

The electrical industry must 'do its bit —250 men are needed at once.

Recruits must be between the ages of 18 and 45 unmarried and in good physical condition

Enlistment in the National Guard gives you an opportunity to choose the branch of the service with which you prefer to be associated

Applications will be received at local headquarters of the New York National Guard at

ELECTRIC RAILWAYS IN WAR TIMES—ENLISTMENT POSTER IN NEW YORK

EDITORIAL CONFERENCE AT WASHINGTON

A meeting of the editors of the technical and business papers to determine how these periodicals can best assist in the war was scheduled to take place in Washington, D. C., on May 25. Arrangements were made for short addresses during the morning from the following: George Creel, chairman committee on public information; Francis S. Peabody, chairman fuel board, Council of National Defense; David F. Houston, secretary of agriculture; Franklin K. Lane, secretary of interior; Newton D. Baker, secretary of war; Josephus Daniels, secretary of navy; William C. Redfield, secretary of commerce; Frank A. Vanderlip, president National City Bank, New York City; and William B. Wilson, secretary of labor.

The program for the afternoon included addresses from Van H. Manning, director United States Bureau of Mines; Herbert C. Hoover, food administrator; Walter Gifford, director Council of National Defense; Frank Scott, chairman munitions board, Council of National Defense; Dr. Martin, in charge of Red Cross work, Council of National Defense; Fairfax Harrison, chairman, or some other member of the railroad executive committee, Council of National Defense; George Otis Smith, director United States Geological Survey, and R. W. Woolley, director of publicity, Liberty Loan of 1917.

During the year 1916 there were 108 persons killed and 416 injured in grade-crossing accidents in the State of California. There are 10,000 grade-crossings in that State.

American Association News

Chairman of Committee on Company Sections Addresses Open Letter to Railway Managers—Bulletin o Committee on National Defense Is Reprinted in Full—Reports of Section Meetings Show Great Diversity of Topics Treated

Why Not Extend the Company Section Hand to Your Organization?

An Open Letter to the Managers of Electric Railways in the United States

BY MARTIN SCHREIBER
Chief Engineer Public Service Railway, Newark, N. J.

At present there are eleven company sections in the American Electric Railway Association. The fact that these sections started with 1000 members and now have 1900 stands out as indisputable evidence of the success of the company section movement. There has never been a time when the association has had a better opportunity to help the electric railway company than right now, and one way in which it can do this is by the organization of company sections.

To-day the electric railway industry is facing a fixed fare, regardless of the great advance in cost of labor and material. The price of labor and material is governed by the open market, and you cannot escape taxes, insurance or carrying charges. Until increased rates are allowed about the only opportunity for saving is to increase the yielding power of the organization. We invent machines to do more work; we devise new methods to increase efficiency; but have we spent sufficient effort to bring out the full possibilities dormant in our individual employees? Did you ever stop to think that it is not uncommon for men employed at piece work to produce one and one-quarter times the work of men hired by the day? Suppose each man could do one-tenth more work on a railway system than he is doing. On a system with $1,000,000 gross income the operating expenses would be $650,000, approximately speaking, of which $325,000 would be for labor. Ten per cent would represent a saving of $32,500. For a property with $10,000,000 gross the saving would be $325,000 a year. However, you should keep in mind that the greater yielding power of an organization may also be developed in ways other than by saving of actual hours, because you must take efficiency into consideration, such for example as is produced by power saving. It has been consistently shown that careful operation of cars often saves ten per cent on the power bill.

AN EMBLEM OF THE CO-OPERATIVE SPIRIT

Again, you can make money by ways other than saving it; you can spend money advisedly so as to get new business, and increase your revenues by advertising. The best advertisement is good and attractive service, performed by willing, courteous and intelligent representatives.

To be brief, is not the real answer to the efficiency question found in training your employees, and isn't the company section an ideal training camp?

First, you want loyal men. Men are loyal when the company shows an interest in them. It's sort of a "fifty-fifty" proposition. Forming a company section shows the employees that the company is trying to help them.

Second, the company section promotes personal ambition. Personal ambition is a promoter of enthusiasm. Enthusiasm is absolutely necessary for every progressive and successful business.

Third, where you have kindled honest enthusiasm, you unconsciously inspire a thirst for knowledge. Here is where a company section can do wonderful work; the possible activities hardly need comment.

Fourth, as soon as employees of the electric railways begin to obtain knowledge of the electric railway business, just then is when they begin to become more efficient and realize the tremendous power of team work, which is now looming up so formidably in military operations.

Fifth, with the cultivation of loyalty, enthusiasm, efficiency and team work among the employees, it goes without saying that you will develop great improvement in public relations.

These are a few reasons why the writer believes that the electric railway companies should extend the company section hand to their organizations.

Co-operation for National Defense

Some weeks agò the American Association Committee on National Defense sent to member companies, over the signature of Gen. George H. Harries, chairman, a bulletin containing specific suggestions as to what can be done to prepare electric railway properties for active co-operation with the government. By way of supplementing the committee's mail campaign and to remind the electric railways again of the importance of prompt action on their part the bulletin is reprinted below in full.

To Member Companies:

After having studied with some care such interesting information as has been received from nations in Europe now at war, the Association's committee on national defense presents for your consideration the following suggestions with respect to matters that are now or may soon be of material interest to you.

One of the immediately essential things is the protection of the property of each company. In view of property destruction which has already taken place in this country and because there undoubtedly are many conspiring enemies within our borders, we suggest that attention be promptly given to:

(a) The protection of strategic points of railroad line, such as bridges, tunnels, junctions, dispatching stations, and of coal supply and transmission lines.

(b) The inclosing of power-house yards with heavy fence and ample lighting of such yards and of areas around the storehouses, shops and carhouses.

(c) The furnishing of all power-house and shop employees with badges and permits so as to pass the watchman in charge who should, so far as possible, be acquainted with each individual.

(d) The selection of men in each plant for "special officer" duty so that they may be used as police when occasion arises.

(e) The careful scrutiny of personnel of employees.

The continued operation of all transportation agencies is a vital necessity to the national defense and it is therefore desirable that all officers essential to the transportation service continue in their present positions in so far as possible, rather than enlist for active service under the government; however, as a large body of electric railway employees in various branches of service will undoubtedly be required for army duty, we suggest:

(a) That each company should make a list of the men who would probably thus leave the company's service—so that the company could reasonably estimate upon the vacancies which would have to be filled under such circumstances.

(b) In connection with the foregoing it would undoubtedly be desirable to have lists of applicants previously rejected by the company because of some physical disability; so that those of them who could be used in emergency might be readily accessible.

(c) That consideration be given to the possible use of women as conductors and for other positions in the company's service. This should be carefully studied.

(d) That it would be well to have a complete census of all employees so as to have on record their varieties of usefulness and their special ability along certain lines of service which might or might not be military.

(e) That consideration be given to the laying in of supplies difficult to obtain in time of war.

(f) That thought be given to the possible adoption of portion of shop equipment and space for the manufacture of supplies or repairs essential to army transport.

(g) That arrangements be made for duplicate power supply to provide for possible break-down or to meet unusual demands.

Because of the call for military service it is desirable that companies be in a position to assist in the selection of individuals by government officers, and we would therefore suggest that:

(a) A list be made of available men who might be used as non-commissioned officers in the engineering corps of the army.

(b) The free use of available carhouses and offices for recruiting and medical examination of employees and others be offered.

(c) There may be outdoor recruiting assistance by advertising cars carrying brass bands, speakers, etc.

(d) There be plans for collection in cars or at carhouses of money contributions for comforts to be forwarded to soldiers and sailors.

Many transportation corporations have adopted the following policy in the treatment of such of their employees as may enlist at the present time:

Positions will be available for such employees upon their discharge from National service, but no compensation will be made to such employees during the terms of such service. This does not refer to men who have previously enlisted in the National Guard.

The question of tariffs which must be filed with the War Department in order that the movement of men and supplies by electric lines may be authorized has been taken up with the War Department by the committee, and as soon as definite information is received it will be communicated to member companies.

Attention is called to the desirability of co-operation in the matter of keeping down the cost of living. It may be said in this connection that several member companies have already offered, rent free, plots of vacant land in their possession, to such persons as are willing to cultivate them for the purpose of raising garden truck and other crops.

It is possible that many lines will be called on for abnormal increases in service due to the carrying of men, munitions and general supplies to coast defense works, mobilization points, munitions and other factories. The conditions thus likely to be created might well be studied in advance so that high efficiency may be possible as soon as the pressure begins to be applied. Prospective sidings, extensions, increases in equipment and related matters may well be considered at this time by companies in very many communities.

The committee is prepared to do all in its power to secure for member companies any specific information which may be asked of it and will devote itself to the duty of assisting in an orderly solution of a national problem, in which problem each company is an element.

Recent Committee Meetings

At a meeting of the T. & T. Association committee on construction of schedules and time-tables held in New York on April 24, the discussion centered on the subject of traffic in congested districts. The meeting was attended by Alexander Jackson and H. C. Donecker, Newark, N. J.; H. F. Fritch, Boston, Mass.; J. A. Stoll, Baltimore, Md., and F. L. Hubbard, Toronto, Ont. It was decided that the following members should visit the cities designated for the purpose of studying the topic in hand: Messrs Stoll and Jackson, Newark, Baltimore and Cincinnati; Messrs. Hubbard and Fritch, Cleveland; Messrs. Dana and Fritch, Springfield, Mass., and Mr. Dana, New Orleans. These visits will be made at early dates.

A joint meeting of the two association committees on electrolysis (American and Engineering) was held in New York on May 4. The matter under discussion was the proposed form of the final report of the national joint committee on electrolysis, on which committee the associations are represented by Calvert Townley, New York City; A. S. Richey, Worcester, Mass., and R. P. Stevens, Youngstown, Ohio. In attendance at the meeting were Messrs. Townley and Richey, and E. J. Blair, Chicago, Ill.; E. B. Katté, New York City, and I. W. Gross, New York City.

Signal Oil Discussed in Chicago

At the regular monthly meeting of the Elevated Railroads company section held on May 15, the principal speaker was John W. Bunn of the Galena Signal Oil Company, who presented a paper on "Signal Oil." The report of a local committee appointed to consider the "Definitions of Electric Railway Transportation Terms" submitted by the T. & T. Association for study by the company sections was presented and ordered forwarded to the secretary of the American Association. The formal part of the program was relieved by instrumental and vocal music and athletic events.

Public Service Section Visits Power Plant

A party of 165 members of the Public Service Railway Company section spent the evening of May 17 at the Essex power plant of the Public Service Electric Company, which is located on the Passaic River, 2½ miles east of Newark. The party assembled in Newark and was taken to the plant in special cars. Representatives of the electric company familiar with the details of the plant escorted the men through the station and explained the working of the equipment.

This plant, of which details will be given in a later issue of the ELECTRIC RAILWAY JOURNAL, is the latest one constructed by the electric company. At present two 25,000-kw. turbine units are in operation, and one of 35,000-kw. capacity is being installed. The boiler plant is also being extended and an order for a 50,000-kw. turbine unit has been placed for delivery in 1919. It will be some years before the plant reaches its ultimate capacity, which will be more than 200,000 kw.

Patriotism Displayed by Milwaukee Section

The regular meeting of Section No. 1, held on May 10, with an attendance of seventy-five, was largely of a patriotic character. Sergeant-Major Albert Wood gave a talk on life in the trenches, based on personal experience in campaigns in which he had been several times wounded. He was loudly cheered by the audience. R. B. Stearns followed with an outline of the duty of the American citizen, after which the color squad from a local United States recruiting station marched in. An officer read a telegram calling for volunteers for the telephone and telegraph divisions of the army.

In addition to the patriotic number there was an illustrated address by R. C. Gosrow on "A Trip Through California," with particular reference to the steel industry.

Educational Work of Toledo Section Is Successful

At the meeting of company section No. 11, held on April 27, a report of the group work committee was presented, showing encouraging interest in the educational work. The total weekly attendance on the sessions of classes in arithmetic, algebra, electricity, drafting, bookkeeping, gas work, steam boilers and painting ranged between 203 and 235, with an average attendance of 93 per cent of the registration. During the first month ninety-seven class sessions were held. At this meeting an address on "Modern Tendencies in Illumination" was given by H. H. Magdsick, illuminating engineer General Electric Company, Cleveland, Ohio. The attendance at the meeting was 150, slightly less than one-half the total membership.

"Co-operation" the Topic at Meralco Section April Meeting

At the meeting of the Manila Electric Railroad & Light Company section, held on April 3, N. Tranfaglia, track foreman, read a paper on "Co-operation," which was discussed by a number of members. Sixty-eight members responded to rollcall and twenty-two new members were added to the railway division of the section. Of these thirteen were from the transportation department, six from the commercial department and three from the power-plant department. In addition to the formal proceedings there was a fencing contest between two members of the transportation department, a song in Tagalog by a transportation department inspector and music by the orchestra composed of members of the transportation department.

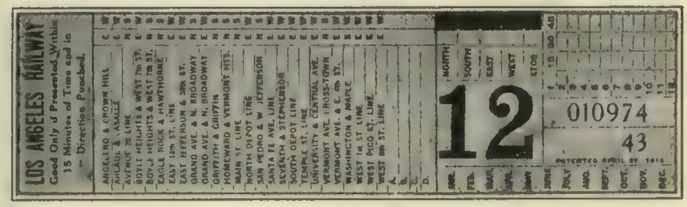
Mr. Tranfaglia began his paper with the homely adage, "Una mano non si lava sola, una lava l'altra e le due lavano il viso." This, translated into English, means, "One hand does not wash itself alone, one hand washes the other and the two wash the face." This adage, he thought, contains the germ of co-operation. Applied to electric railway work this means that an employee not only has to earn his daily bread and better his financial condition, but he must co-operate with his fellow employees and be on the watch to better his employer's interest. This involves a workable system to minimize expenditure of time and money, otherwise great wastes will result especially if a large number of men are involved. Co-operation is necessary not only to secure good results in work, but to promote good-fellowship and mutual understanding in order that one's store of knowledge may be increased. Through co-operation, men can do things that otherwise would be impossible.

In the discussion, R. E. Brooks, assistant superintendent of shops and carhouses, showed how co-operation would help his department. Frequently other departments ask for work on rush orders when by the exercise of foresight this could have been put through the regular channels without inconvenience and extra cost. This, of course, does not apply to emergencies. B. H. Blaisdell, chief engineer of power plant, referred humorously to the department which borrows from the power plant a couple of cubic meters of sand or a few tons of coal in an emergency, expecting subsequently to furnish the proper order but sometimes neglecting to do so. In his opinion the greatest enemy to co-operation is selfishness, although the desire for co-operation is inherent in most men. This quality, however, needs cultivating.

New Transfer Developed at Los Angeles

The Los Angeles Railway Corporation has in experimental service a new type of transfer, the special feature of which is that it may be used on all the lines of the company. This reduces the number of transfers required to be kept on hand and consequently the amount of waste in old transfers. The line punched is that of the issuing line, and in the column of lines there are four blanks marked A, B, C and D, which can be used for new lines. As some lines do not transfer to other lines, to prevent looping back the company will issue a book of instructions to conductors showing the points at which transfers are not issued.

Five punches are required, namely, the direction in which the car is moving, the direction in which the passenger is entitled to go, the month, the a. m. or p. m., and the time limit. The issuing line punch and the month punch can, of course, be made before the conductor starts from the carhouse and the a. m. or p. m. punch before starting on each trip. The punch showing the direction in which the passenger wishes to go may also be eliminated, because the receiving conductor should know, when a transfer is handed to him, the line by which it was issued, so that the hour is really the only punch required during the trip. The trial of these transfers is being conducted by Charles Barrington, Jr., purchasing agent Los Angeles Railway Corporation.


LOS ANGELES RAILWAY
Good Only if Presented Within 15 Minutes of Time and in ← Direction Punched.
ANGELENO & CROWN HILL
ARCADE & LASALLE
AVENUE 20 LINE
BOYLE HEIGHTS & WEST 7th ST.
BOYLE HEIGHTS & WEST 7th ST.
EAGLE ROCK & HAWTHORNE
EAST 14th ST. LINE
EAST JEFFERSON & 38th ST.
GRAND AVE. & N. BROADWAY
GRAND AVE. & N. BROADWAY
GRIFFITH & GRIFFIN
HOMEWARD & VERMONT HTS.
MAIN ST LINE
NORTH DEPOT LINE
SAN PEDRO & W. JEFFERSON
SANTA FE AVE. LINE
SEVENTH & STEPHENSON
SOUTH DEPOT LINE
TEMPLE ST. LINE
UNIVERSITY & CENTRAL AVE.
VERMONT AVE. CROSS-TOWN
VERMONT AVE. & E. 4th ST.
WASHINGTON & MAPLE
WEST 1st ST LINE
WEST PICO ST. LINE
WEST 6th ST. LINE
A
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C
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NORTH
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JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.

TRANSFER BEING TRIED IN LOS ANGELES

Arkansas Association Meets

The tenth annual convention of the Arkansas Association of Public Utility Operators was held at Pine Bluff, Ark., May 16-18. At the business session the following were elected officers for the ensuing years: President, S. E. Dillon, general manager Citizens Electric Company, Hot Springs; first vice-president, E. T. Reynolds, manager Arkansas Light & Power Company, Paragould; second vice-president, P. T. Phillips, engineer Little Rock Railway & Electric Company; secretary-treasurer, R. B. Fowles, auditor Pine Bluff Company.

W. N. Gladson, dean of the electrical department of the University of Arkansas, was elected to honorary membership in the association.

The convention voted to meet in Hot Springs, Ark., in 1918. The executive committee of the association will be appointed by the new president, and this committee will select the date for the 1918 convention. The attendance far surpassed all past conventions, from the viewpoint of the number of companies represented, there being representatives from thirty-five public utility companies of the State. C. G. Griffin, general manager Little Rock Railway & Electric Company, presided at the annual banquet.

COMMUNICATIONS

"Killing" the Trolley Wire Near Open Drawbridges

NEW YORK CITY, May, 21, 1917.

To the Editors:

In the issue of the ELECTRIC RAILWAY JOURNAL for May 27, 1916, under the heading "Prevention of Drawbridge Accidents" the following statement is made by one of your contributors: "Trolley cars are subject to accidents at drawbridges used over rivers, due to the opening of the bridge just as the car reaches it, unless some means of 'killing' the trolley wire before the bridge is opened is provided."

The suggestion which this writer makes has been advanced innumerable times in various journals, at hearings, etc., by men apparently entirely unfamiliar with the actual operation of cars over drawbridges. They overlook the fact that to be successful or satisfactory a method of stopping cars before entering a draw must be foolproof. The average car approaches a draw with the power off anyway, so that the cutting off of the power on the trolley wire has little or no effect upon the problem.

A car can as readily coast into an open draw as it can go into it with power on. Moreover, the "killing" of the trolley wire a short distance back from the draw might result in a catastrophe which could otherwise have been prevented. For instance, if upon approaching a draw a motorman should shut off his power and apply his brake, and should find that, due to a broken brake rod, lack of air, or for any other cause the brake mechanism was inoperative, he should immediately, in accordance with instructions, apply his reverse. While he could, with a double-truck car, for a short distance get an electric brake effect without any power, he could not with a single-truck car get any such result. Thus the only means of stopping his car, his brake mechanism having failed, would have been taken away from him by the unique device of having "killed" the trolley wire in the vicinity of the bridge.

"RAILWAY MANAGER."

Speeding Service by Educating Public

BURLINGAME ELECTRIC RAILWAY
BURLINGAME, CAL., May 19, 1917.

To the Editors:

I have read with great interest the articles which have appeared in the ELECTRIC RAILWAY JOURNAL on attempts to educate the traveling public on safety and kindred subjects. But I have seen no suggestion from any railway that passengers waiting to board a car should be instructed to stand still as the car approaches. The average person seems to think it necessary to anticipate the stop to be made by the car by walking forward or backward, and the consequence is that on heavy lines the time lost for waiting for these persons to board the car is very considerable in the course of a day.

In the interest of saving time the average trainman will make his stop with the car entrance as near intending passengers as he can. But when the patrons walk ahead or back, accurate calculations in this respect are almost impossible.

It seems to me that if the public could be educated in safety measures, skip stops, and other ways of speeding up service, this subject should also receive attention, to the advantage of both the public and railways.

F. P. WILL, Superintendent.

Equalizer Bars Not Necessary for Either Easy Riding or Safety

NEW YORK, WESTCHESTER & BOSTON RAILWAY
NEW YORK, May 22, 1917.

To the Editors:

I have been very much interested in S. A. Bullock's article published in your issue of April 21 regarding the need for equalizer bars for electric trucks, as well as in the discussion that has followed the original article. A second reading leaves one strongly with the impression that the case in favor of the equalizer bar has been made mainly out of arguments over points of fact.

In the article in question the equalizer bar is advocated for high-speed service on two grounds. One of these is that the equalizer bar, alone, gives proper distribution of the load over the four wheels of the truck. But this load-distribution, as pointed out in W. F. Kiesel's clearly thought-out communication in the issue of May 5, affects particularly the ability of the truck to stay on the track, and a truck in which the load is improperly distributed over the wheels must, of necessity, be frequently derailed if run at high speed. Therefore when Mr. Bullock says that the use of springs over the journal boxes (instead of equalizer bars) gives improper load-distribution, he says in effect that trucks built according to all such designs must be subject to derailment.

Yet would anyone want to claim that the Pennsylvania Railroad's standard four-wheeled passenger trucks, which do not have equalizer bars, are frequently derailed? On the New York, Westchester & Boston Railway the car trucks have springs over the journal boxes and no equalizer bars, but five years' experience without a single derailment of these cars in high-speed service has demonstrated that the equipment is the safest in the country. Hence, in Mr. Bullock's statement that equalizer bars are necessary for high-speed trucks he submits, as his argument, a personal opinion to oppose the established fact that cars which do not have equalizer bars have been operated for years in perfect safety.

The second reason put forward in the article in support of the equalizer bar is that, without it, springs must be installed over the journal boxes and that these occupy an unduly large space. Undoubtedly, the idea intended here is that the available space over the journal box is too small for springs of proper amplitude, and that in consequence cars without equalizer bars must ride badly. Here again is a personal opinion opposed to an established fact. The Westchester car trucks have enough space over the journal boxes even for springs much longer than those actually used. At the same time the Westchester cars ride easier than any of the cars with equalizer-bar trucks that are in similar service in the same district, and the difference in riding qualities is so marked that it is apparent at once to anyone who rides on these cars.

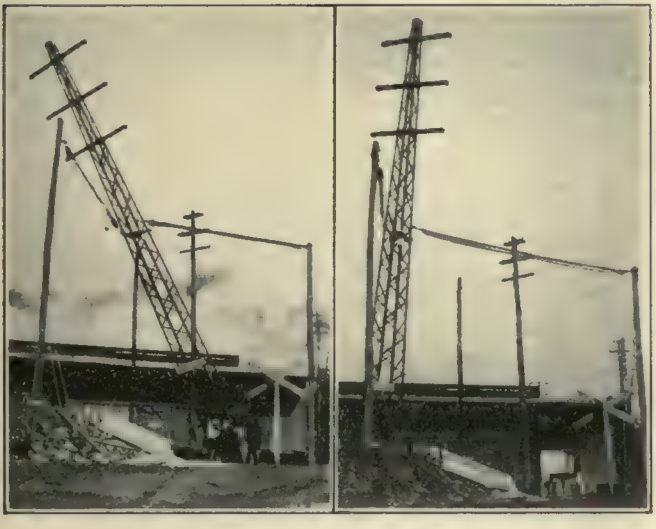
It may be that reasons, other than the two mentioned, exist for the use of equalizer bars in high-speed service, but if they have to be supported by arguments based on the non-existence of established facts they are not likely to prove the use of equalizer bars to be necessary. Indeed, since modern cars that are both easy riding and safe against derailment can be, and have been, built without adopting the equalizer-bar construction, it seems proper to say that equalizer bars are not even permissible, because of the undesirable increase in weight and complication which their use involves.

R. R. POTTER,
Superintendent of Equipment.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.



MOVING STEEL TOWER WITH GIN POLES

Steel Tower Moved in Thirty Minutes

Two Gin Poles Used to Transport a Transmission-Line Tower 30 Ft.

BY E. B. HOOK, JR.
Superintendent of Construction, Georgia Railway & Power Company

On account of changing the direction of a street in Rome, Ga., the 75-ft., 4-ton steel tower shown in the accompanying illustration had to be moved 30 ft. to bring it to one side of the roadway. This operation was performed by means of two 40-ft. gin poles, thirty minutes being required to move the tower and bolt it to the new concrete foundation. Snow and sleet were falling during transportation. The insulators were removed from the tower and the 66,000-volt lines temporarily supported on wood poles. Blocks and tackle were fastened to the tower and the gin poles, which were erected and guyed at each end of the line along which the tower had to be moved. After the tower had been tilted in the direction it was to be moved the tackle on the pole toward which it leaned was hauled in, thus dragging the base of the tower into its new position. The other gin pole and tackle prevented the tower toppling over entirely.

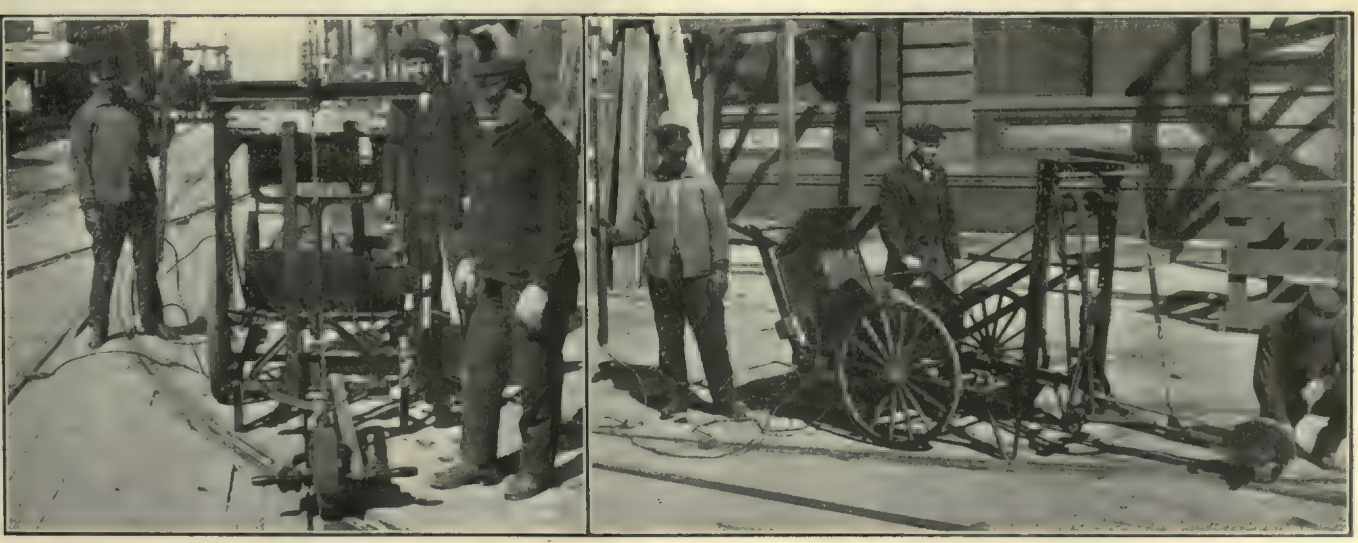
The "Swing-Frame" Grinder

A New and Effective Machine for Grinding Rail Grooves, Switch Tongues, Frog Points, Etc.

BY R. C. CRAM
Assistant Engineer Way and Structure Department Brooklyn Rapid Transit System

The machine which is described in this article was developed for the purpose of accomplishing the same results as are produced with the several makes of flexible shaft grinder but with a form of drive which would be less expensive for maintenance. A rather cumbersome machine was first put together and, after trial results had indicated that the principles were applicable to this work, the refinement of the machine was carried out with the co-operation of the mechanical department of the company.

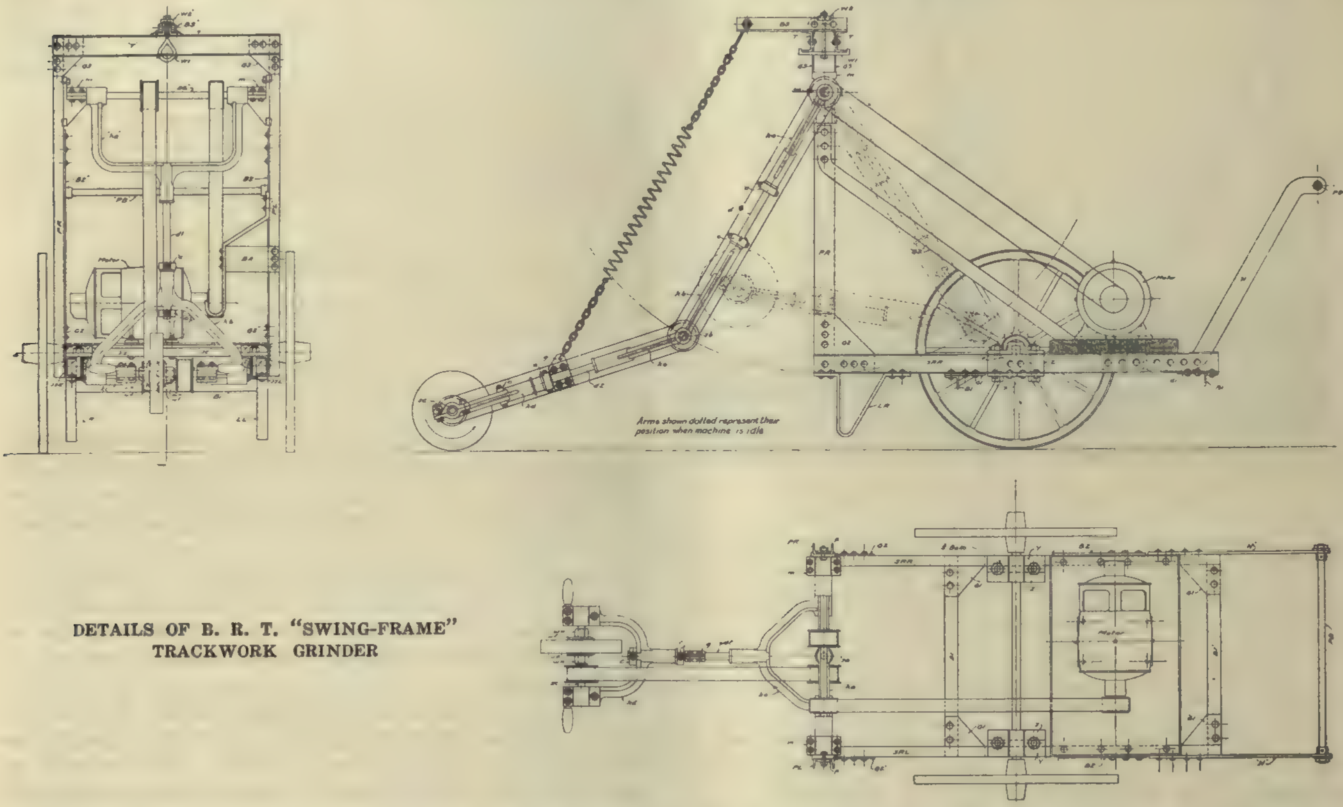
The resulting machine is shown in the illustrations presented herewith. For want of a better name it has been called a "swing-frame" grinder. The drive is by belts from an electric motor to two countershafts, each mounted in yoke-shaped castings. The upper casting is mounted upon channel-iron posts, and this casting supports a vertical arm which in turn supports a yoke carrying a horizontal arm, at the outer end of which is another yoke to which the grinding wheel is attached.



"SWING-FRAME" GRINDER DEVELOPED BY BROOKLYN RAPID TRANSIT COMPANY FOR SPECIAL JOBS IN TRACK WORK

Each arm is arranged to swivel, thus providing for horizontal lateral movement and angular movement as required in grinding grooves. The combination is such as to provide a universal movement for any desired position of wheel and any direction of movement. It will be noted that the pulleys are kept in fixed positions which, in turn, secures constant tension on the belts at all times.

The horizontal arm which carries the grinding wheel is supported from a short outrigger arm by a spring of sufficient strength in tension to hold the grinding wheel above the ground except when force is exerted by the operator when he is ready to grind. This spring also takes up initial shocks in the wheel when first attack is made, and greatly relieves the strain on the operator when controlling the wheel. When not in use the swing frame holds back toward the platform and the horizontal arm is held in place by a hook.


Arms shown dotted represent their position when machine is idle
Motor

DETAILS OF B. R. T. "SWING-FRAME" TRACKWORK GRINDER

The machine can be handled by one man in an emergency but it is customary to have two men besides the operator. One of these attends to the overhead power contact device and the starting of the motor, while the other acts as flagman to protect the operator and apparatus. It is our custom to have three men with all grinding outfits.

The machine is operated by a 3-hp. Diehl continuous-duty, 550-volt, d.c. motor, having a speed of 1500 r.p.m. The motor is protected by a light steel asbestos-lined housing which appears in the halftones but is not shown in the drawing. The complete outfit, without grinding wheels, costs about $350, when prices of motors and materials are normal. The development of the machine has been directed by C. L. Crabbs, engineer of way and structure of the B. R. T. System.

A city system in the Far West is not buying new axles but works over old Pullman axles as follows: Axles of 5½ in. to 6 in. diameter are heated to a cherry red heat to break out crystallization and then turned down to 5 in. diameter. Old 5-in. axles are hammered down to 4¼ in. and turned down to 4 in.

Change in Lubricating Methods Effects a Big Economy

Cost of Lubricants per 1000 Car-Miles Reduced from 84 Cents to 22 Cents by Using Proper Lubricants and Oiling Scientifically

BY F. H. HILL
General Manager Elmira Water, Light & Railroad Company, Elmira, N. Y.

Master Mechanic H. C. Kaercher has reported that a considerable saving in the cost of lubrication has been accomplished in our shops by changing both the method of doing the oiling and the kind of lubricants used. Our cars are equipped with many different types of motors, most of which are old style and of General Electric Company make. The old method was to oil the armature and axle bearings and the gears of every car every night. The oiler had eighteen or twenty cars to handle during the night, and as he had to hurry his work he did not do it well and a great deal of the lubricant was wasted.

The method which has effected economy both in the quantity of lubricants used and in the labor consists in inspecting the cars after every 1000 miles of service, and the cars are oiled only at the time of inspection. No work is now done at night. The oiler is on the day shift and as he has only four or five cars a day to handle he can do the work thoroughly. The journal boxes are kept clean, covers are repaired and kept on and the brasses are kept in good shape. After completing this work the oiler has time for other duties in the shop.

With this method of doing the oiling it was necessary to select lubricants which would stand 1000 car-miles of service without being replenished. For the gears U. S. Graphite No. 2 grease was found to be of the right consistency. This collects at the bottom of the gear case and will not leak out or creep out along the shaft. For the armature and axle bearings No. 2-H. Tulc, a grade of solidified oil made by the Universal Lubricating Company, Cleveland, Ohio, was used with No. 2-J. P. Tulc waste. This combination proved to have the right consistency so that the lubricant would not run away.

The following figures show how the cost of lubricants alone was reduced as this method was put in operation and gradually improved upon. The cost of all lubrication is given. It includes oil and waste for the car motors, journals, air compressors, gears and pinions, side and center bearings, brake rigging, etc.

Cost of Lubricants

January to April, inclusive, 1915	$360.42
Average cost per month	90.10
Average cost per 1000 car-miles	.84
May to August inclusive, 1915	187.01
Average cost per month	46.75
Average cost per 1000 car-miles	.37
September to December, inclusive, 1915	115.28
Average cost per month	28.82
Average cost per 1000 car-miles	.25

The average cost of lubricants for 1915 was 49 cents for 1000 car-miles. During 1916 by still further perfecting the method described, the cost has been reduced to 22 cents per 1000 car-miles, although the price of lubricants has gone up about 25 per cent. To these figures must be added the labor saved and the benefit derived from better lubrication to obtain the economy of a new lubricating system.

Flexible-Base Jacks in Pole Handling

On one of the large city railway properties the customary method of raising a track blockade caused by a derailment or the breaking down of a wagon or truck has been expedited by the use of flexible-base jacks. Now, instead of sending out a heavy slow-moving emergency wagon equipped with jacks, and block and tackle, a light motor truck which can make 40 m.p.h. if necessary is sent out when the emergency call arrives. The equipment of the light truck on this particular property includes a Templeton, Kenly & Company, Ltd., No. 310 Simplex emergency jack designed with a flexible base so that it will not only lift but can also shove at an angle to the pavement. By the use of this jack it is possible in many instances to slue a broken-down truck out of the way of the street cars or to rerail a car long before the heavy emergency wagon would arrive.

Many railway and lighting companies have taken up the use of heavier flexible-base jacks for handling poles, particularly for use where the poles must be pulled or moved in the ground. For such use the pole jack includes 8 ft. of chain for getting a bite on the pole, a long steel lever bar, and an I-beam base to furnish bearing on the pavement or in soft soil. By means of the flexible-base jack, poles are easily pulled out without digging up the pavement, or if it is necessary to move a pole or to straighten it, a flexible-base jack and its base and chain provide simple equipment for quickly doing the work with fewer men than were required before.

Notes on Small Tool Practices in International Railway Shops

Tools for Making Trolley Wheels, Brake Hangers, Turning Wheel Tires, and Boring and Turning Bearings

In the Cold Spring Shops of the International Railway, Buffalo, N. Y., there are many special tools and jigs which have been developed to assist in keeping dcwn maintenance cost. G. W. Dunlap, superintendent of power and shops, has furnished information on which the following notes are based.

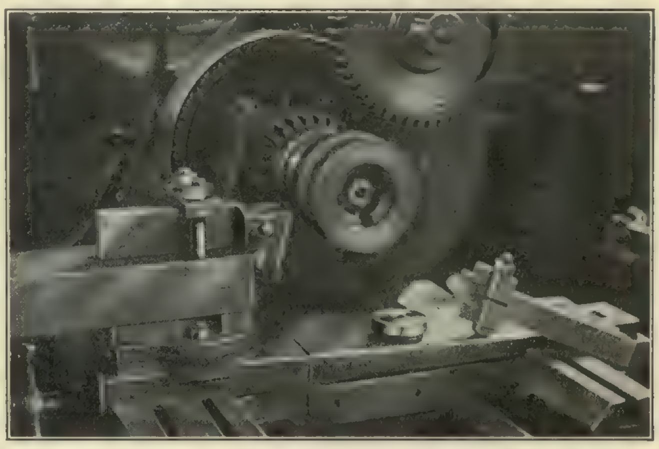


FIG. 1—TROLLEY WHEEL CHUCK AND FORMING TOOL FOR OUTSIDE SURFACE

This company makes its own trolley wheels in 6-in. and 4-in. sizes. For the 6-in. wheel a plan is used by which it is possible to rough-bore, face, ream, and turn one end of the hub in one operation consuming ten minutes. For this purpose the rough casting is mounted in a chuck like that shown in Fig. 1. This chuck consists of three pieces, the first of which is screwed onto the lathe spindle. On this is screwed the second piece which forms the backing for the trolley wheel, which is securely clamped against it by means of a nut.

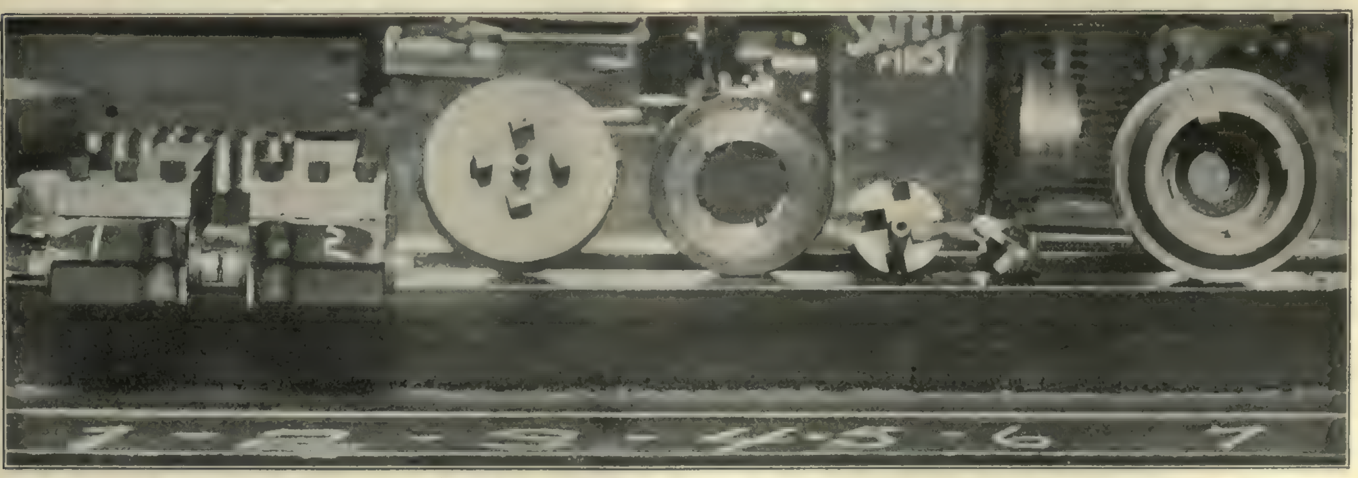


FIG. 2— TOOLS MADE AND USED IN COLD SPRING SHOPS, INTERNATIONAL RAILWAY—1, 2, PAIR OF FLANGING TOOLS FOR TIRE LATHE; 3, 4, 5, TOOL FOR SURFACING END OF BALL HANGER; 6, TOOL FOR FORMING SPHERICAL SEAT FOR BALL HANGER; 7, SELF-CENTERING CHUCK FOR TROLLEY WHEEL

The groove is surfaced by means of a special cutter of high-speed steel, held by means of a dove-tail tenon in a holder. This cutter is 4-in. long and has a wear life of one year. The cutter and its holder are shown resting on the tool post carriage in the figure. A drill guide, also seen resting on this carriage, is used to center the drill, which is carried by the tailstock. After drilling, the hole is reamed and the bushing is pressed in. For the outside cut a speed of 50 r.p.m. is used, and for the boring and reaming 200 r.p.m.

For the smaller wheels a special centering chuck is used which is shown at the extreme right, No. 7, in Fig. 2. This consists of four jaws, hinged at the back, and forced radially inward by a taper on the inside of the threaded ring which surrounds the chuck. This ring has four square threads to the inch. For the outside work on small wheels, the same kind of a cutter is used as with the large ones.

For the purpose of forming the ball on the head of the iron brake hangers, and the spherical seats in the sockets in which the heads of the hangers play, tools of the form shown in the center of the group in Fig. 2, Nos. 3, 4, 5 and 6, are used. These cutters are used in a drill press.

Details of the tool used in forming the heads are shown as Nos. 3, 4 and 5 in this figure, the complete tool being No. 3. It contains four cutters, two for roughing and two for finishing. The manner in which these cutters are held is shown in Nos. 4 and 5, where the central portions and cutters have been removed. No. 4 is the clamping ring and body of the tool, into the center of which fits snugly the slotted core. The cutters are held securely in the slots by means of the set-screws visible in the picture. No. 6 is the four-blade cutter used for making the spherical seats.

At the left in Fig. 2, Nos. 1 and 2, are front views of a pair of tire-turning tools designed to permit the reduction in the waste of cutter metal to a minimum. The original feature is a forged steel holder for the cutter, provided with three set-screws above, and clamp screws and washers to prevent sidewise motion. The lower part of the holder projects to give all possible support to the cutter and it is shaped to the contour of the cutter for the same purpose.

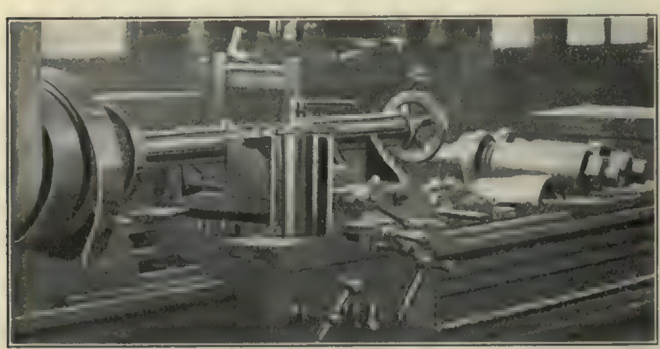


FIG. 3—BORING BAR AND MANDRELS FOR USE IN FINISHING BEARINGS

Fig. 3 shows a boring bar used in boring bearings and also the mandrels upon which the bearings are mounted for outside turning. On these mandrels they are clamped by means of the collars and nuts. The joint surfaces of the bearings are faced in a milling machine with the multiple cutter described in the issue of the ELECTRIC RAILWAY JOURNAL for April 7, 1917, page 654. In common with other companies, the International Railway uses old axles for various purposes, for example, large nuts are made out of this stock. As the journals of car axles wear down the bearings used with them are reduced in size. When no longer useful as such the car axles are turned down into motor axles. Old-style motor cases are rebored for use with larger bearing shells. Other practices used in this shop have been described from time to time in short articles in this department.

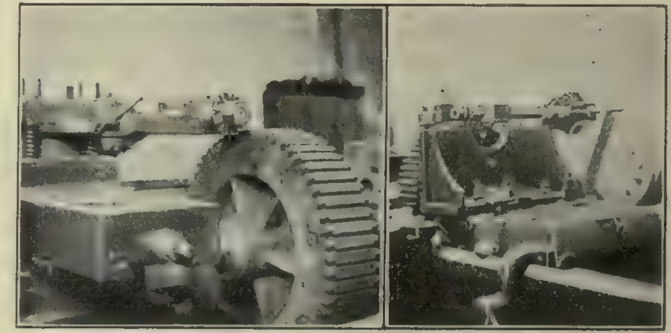
Fiber Gear Cut by Device Rigged Up on Lathe

BY G. B. SISSON

Mechanical Department Georgia Railway & Power Company, Atlanta, Ga.

Our shop is not equipped with a milling machine, and when it became necessary to cut teeth in a large fiber gear a machine lathe with a 36-in. bed and an air drill were set up to do the work, as shown in the accompanying illustration.

The milling wheel for cutting the gear was attached to a 1½-in. shaft supported at one end from the tool holder of the lathe by a heavy steel arm 5-in. wide and at the other end by an air drill which was attached to drive it. To fasten the gear blank in the lathe the tailstock was removed and in its place a heavy angle plate was fastened. The gear blank was clamped to a mandrel, which in turn was bolted to the heavy angle plate. In order to feed the milling wheel through the gear the lathe was started up and the feed on the carriage used.



LATHE AND AIR DRILL USED TO CUT TEETH IN FIBER GEAR

After cutting several teeth it was noticed that the milling wheel became hot. To overcome this a hose was connected to the exhaust opening of the air drill so that the exhaust air was directed onto the cutter. In this way the milling wheel was kept cool. The gear when finished looked like a regular factory job.

Use of Welder and Old Joint Plates Effects Big Saving at Fort Worth

The Northern Texas Traction Company, Fort Worth, has recently completed at a cost of $750 some track rehabilitation which will put off a heavy track expenditure for at least five years. The method used was similar to that described in the ELECTRIC RAILWAY JOURNAL of May 5, 1917, on page 832.

On Front Street the company has about a half mile of double track on which almost every joint was broken. Most of the joints were of the Continuous type with a few of the old, butt-welded Thermit type. To make the new joints, the bottom web of the continuous plates was sheared off. The plates were then reversed, welded to the rails by means of an Indianapolis arc welder and ground down with a reciprocating rail grinder. The average cost per joint, including cutting in 6-ft. to 10-ft. lengths, was $4.50. Of the total cost of the job, $750, $500 was for labor, while the remainder covered welding metal, sand, cement and brick paving.

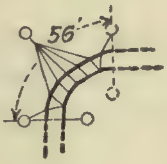
Cost of Erecting Overhead Work—IX

(From the records of a large Eastern company)

The following is the ninth group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; March 31, page 606; April 14, page 702, and May 12, page 880. The remaining groups will appear later.

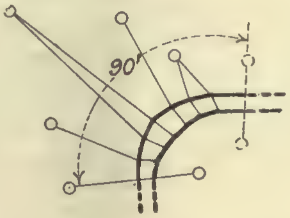
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track plain curve, angle 90 deg.



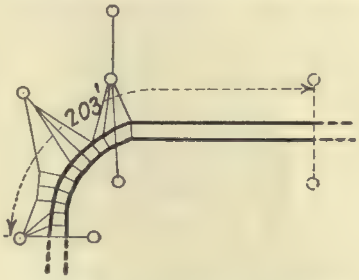
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
62	$12.76	$5.28	$15.95	$6.60	$19.14	$7.92

Double track plain curve, angle 90 deg.



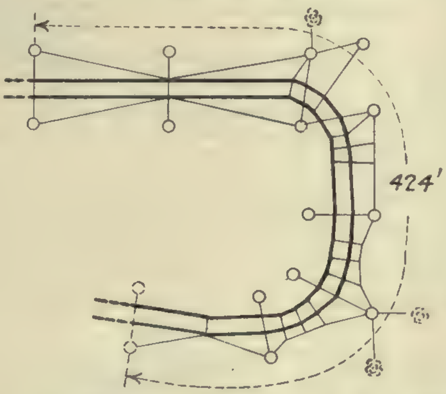
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
63	$12.76	$5.28	$15.95	$6.60	$19.14	$7.92

Double track plain curve, angle 90 deg.



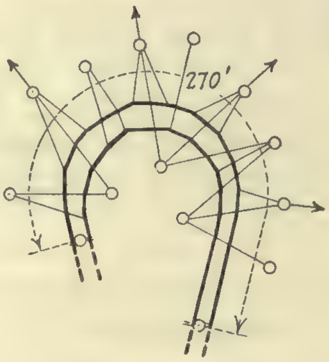
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
64*	$18.15	$13.20	$23.60	$17.16	$29.04	$21.12

Double track loop



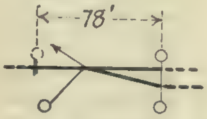
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
65*	$27.23	$19.80	$32.67	$23.76	$45.38	$33.00

Double track loop



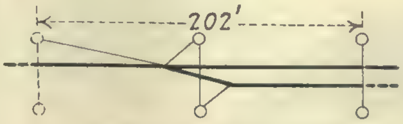
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
66*	$27.23	$19.80	$36.30	$26.40	$54.45	$39.60

Right hand turnout



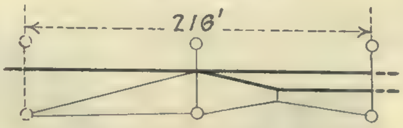
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
67	$7.98	$3.30	$11.17	$4.62	$14.36	$5.94

Right hand turnout



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
68	$9.57	$3.96	$12.76	$5.28	$15.95	$6.60

Right hand turnout

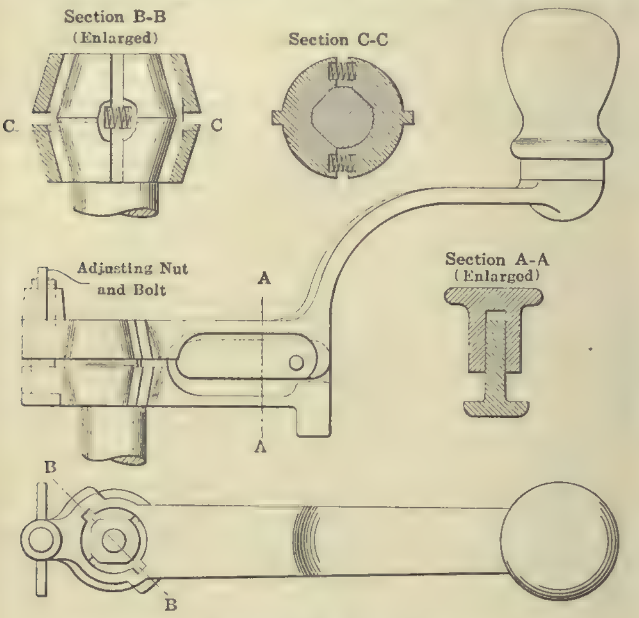


No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
69	$11.17	$4.62	$14.36	$5.94	$17.55	$7.26

*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Spring Chuck for Taking Up Wear in Controller Handles

For taking up lost motion in controller handles the United Railroads of San Francisco, Cal., is using a spring chuck recently patented by one of its employees, Frederick Brostrom.

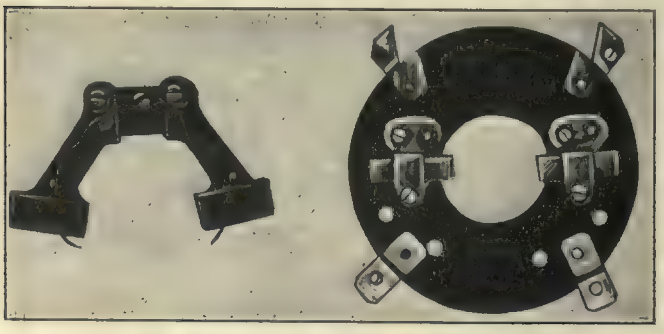


DEVICE FOR ELIMINATING PLAY IN BRAKE AND CONTROLLER HANDLES

The controller handle is made in two sections. The opening in each section which receives the controller post diverges toward the center to form a double taper. These tapered openings house the chuck jaws which grip the controller post, the outside of these jaws being tapered to correspond with the tapered opening in the two sections of the controller handle. When the controller handle is not on the post these jaws are held apart by coil springs. This makes it possible to slip the handle over the post, and by tightening the nut shown on the left in the drawing the two sections of the handle are drawn together, causing the chuck jaws to grip the post firmly.

Heater Motor Maintenance Cost Reduced

Some difficulty has been experienced by the Des Moines City Railway in maintaining the older types of heater motors, both as to bearings and brush-holders. The lubricating rings in the bearings would sometimes get stuck and the bearing would not receive the proper lubrication and would burn out. This was overcome by taking the ring out and filling the oil well with felt and thoroughly soaking this with oil. With this arrangement the motors have run all winter without attention.

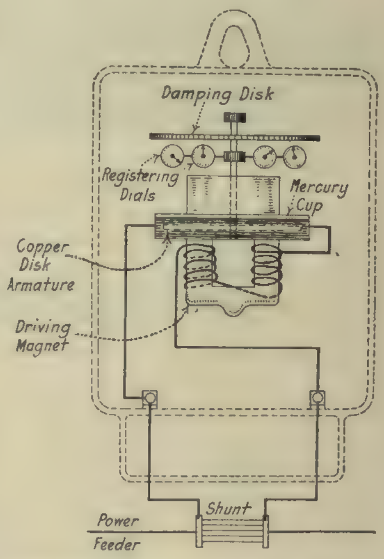


OLD AND NEW BRUSH-HOLDER MOUNTING FOR HEATER MOTORS

Trouble was also experienced with the older-type brush-holders because of the breaking of the small steel springs which keep the brushes in contact with the commutator. The clearance between the ends of these holders was small and oil and dirt accumulation would sometimes short-circuit the brushes so that the motor would not run at full speed. This trouble was eliminated by installing a round fiber plate ⅛ in. thick in the end of the field frame. The fiber was fastened to the frame by four clips. The brushes were then mounted on this fiber ring as shown, and small coil springs in the brush-holders behind the carbons were used to keep the latter in contact with the commutator. The holders were held in place on the fiber plate by simple clips screwed to the fiber. This arrangement also served another important purpose, as it inclosed the armature and prevented trainmen from sticking a screwdriver into the armature to push it around, a practice which frequently damaged the winding.

Meter for Measuring Line Loss

On power feeder lines where voltage regulation must be maintained at extremely close value, it frequently becomes a question as to whether the I^2R loss in the line, measured in dollars and cents power value, will not pay for increasing the size of the feeders. A meter which registers total ampere-squared-hours has been developed by the Sangamo Electric Company, Springfield, Ill. By multiplying the meter readings by the resistance of the feeder the kilowatt-hours of energy lost in transmission are obtained. It is then an easy matter to balance the cost of this energy against the cost of additional feeder copper.



SIMPLIFIED DIAGRAM OF METER FOR MEASURING LINE LOSS IN AMPERE-SQUARED-HOURS

This instrument, known as the I^2R meter, is similar to a standard mercury type watt-hour meter except that a series winding replaces the usual shunt-coil winding of the driving magnet. The accompanying illustration shows a simplified diagram of this meter with the internal and line connections. It is connected to the line in the same manner as an ammeter. The armature of the meter consists simply in a thin copper disk floated in mercury, and the current to be measured passes diametrically across this disk. The strength of the magnetic field of the driving magnet varies proportionately to the current in the line, and since the driving torque on the armature is proportional to the product of the current in the armature and the magnetic field strength, it is, therefore, proportional to the square of the current. The damping magnets perform their usual function in providing retardation proportional to the speed, and result is that the meter records ampere-squared-hours.

The meter has already been used with considerable success by several of the railway companies.

News of Electric Railways

Traffic and Transportation
Financial and Corporate Personal Mention Construction News

Hearing on Philadelphia Bills

Pleas Made Before Legislative Committee at Harrisburg—Mr. Stotesbury States Case as Affecting Himself and Associates

Pleas were made at Harrisburg on May 22 for the enactment at this session of the Legislature of all bills affecting the Philadelphia transit situation. The hearing was before a joint meeting of the judiciary general committee of the Senate and House. Among those who attended were Mayor Smith, Transit Director Twining, Finance Committee Chairman Joseph Gaffney, and two hundred members of the United Business Men's Association.

The Philadelphia Rapid Transit Company requested another hearing at which its representatives could present their side of the case. No date has been set for this hearing. As the hearing progressed it became apparent that the legislators were opposed to further enlarging the powers of the Public Service Commission.

THREE BILLS UNDER CONSIDERATION

There were three bills under consideration at the hearing. They were the Hecht bill, which would give the city the power to take over the lines of the Philadelphia Rapid Transit Company by exercising its right of eminent domain, compensation to be fixed by the Public Service Commission; a constitutional amendment increasing the city's borrowing capacity so as to provide this compensation, and the Salus bill, which would provide through-routing of the city's lines on the Philadelphia Rapid Transit Company's lines and also empower the commission to fix the question of fares and transfers.

While the Senate was still in session during the morning, a letter from Ellis Ames Ballard, chief counsel for the Philadelphia Rapid Transit Company, requesting another hearing, was placed on the desk of Senator Daix, who presided at the hearing. The Senator was absent at the time, but when he returned and read the letter he was surprised, inasmuch as it had been understood that the company's representatives would be present on May 22 and voice their opposition. With the Legislature talking about adjourning on June 14 next, the supporters of the various measures lost virtually all hopes for the passage of the legislation at this session.

Dr. William Draper Lewis, appearing as legal adviser to the city administration, spoke for more than two hours in favor of all the bills. He was frequently interrupted, and at one time clashed with Senator Deidleman, of Dauphin County, regarding the practicability of passing legislation now that would impair the obligations of the city of Philadelphia and the Rapid Transit Company as embodied in the 1907 contract. Senator McNichol and Representative Beyer also interrupted him with questions as to how the proposed measure would affect the Public Service Commission and give it greater authority. The Senator said that the bills also delegated to the commission the authority to say what the people of Philadelphia could do and could not do in their own city. He contended that they practically usurped the authority placed in City Councils, the Mayor and other city officials. The Senator said further that if the bills were passed it was more than likely that there would be a long court proceeding.

Senator McNichol asked the Mayor whether in his judgment it was impossible to reach an operating agreement without passage of the bills.

"If you had asked me that before Mr. Stotesbury's statement of last Friday," replied the Mayor, "I would have said 'No.' In reply to that question now, I would say 'Yes.'"

Several representatives of the United Business Men's Association urged the importance of passage of the pending measures before adjournment is taken next month.

FIRST PUBLIC HEARING IN PHILADELPHIA

The statement by Mr. Stotesbury to which the Mayor referred at Harrisburg was made at the first of the public hearings in Philadelphia on the transit lease matter on May 18. At that hearing the company announced it would be willing to forego an arbitrary right to increase fares, should the city equip the high-speed lines. The company would assume the payment of fixed charges on equipment bonds, and refer fare increases to the Public Service Commission. The first speaker was A. Merritt Taylor, former director of city transit of Philadelphia. He read a long statement in which he defended the lease in every disputed point. He was before the committee more than two hours. Ellis Ames Ballard, counsel for the company, requested to be permitted to clear up some points made by Mr. Taylor about which he thought there might still be doubt. Mr. Stotesbury read his statement. He said that the company had made a most liberal proposition to the city. He could not see how it would aid in the solution of the present question to pass legislation which would put into the hands of any body of men, however wise and public spirited, power to destroy the company. The very existence of such legislation would tend to make it impossible for the company to perform its part of the joint service. Mr. Stotesbury informed the joint councilmanic committee that if the proposed contract could not be accepted by the city, and it was felt that another contract should be negotiated with the company that may take away from the company the 5 per cent guaranteed dividend, he and his associates would resign from the management. This would leave the new directors free to negotiate a contract on terms which the city could accept.

Apparent Deadlock in Providence

The many conferences held between officials of the Rhode Island Company, Providence, R. I., and the delegates from the carmen's union have so far been apparently without definite result. The present agreement expires on May 31, and the matter is believed to be in a deadlock. Two years ago a strike was called. It lasted only one day, however, as both sides to the controversy agreed to arbitration.

Because of the peculiar condition in which the Rhode Island Company now finds itself, it is generally believed that the company will refuse to grant any material increase in wages. It has already appealed to the State for financial relief, and at its request the Legislature has provided for an investigation committee, with power to increase fares if it deems such action warranted and just. In view of this situation, the officials of the company are believed to be averse to making any agreement raising wages, although they have frequently admitted that the men should have more pay. The General Assembly is not in session and under ordinary circumstances cannot meet until January without special call from the Governor.

It is understood that the men are not anxious to have the matter go to arbitration again. The proceedings two years ago were very expensive to both sides. In addition to the expense, the arbitration proceedings were extended over a period of four or five months. There is no State arbitration board or official empowered to act in the emergency in working toward a settlement of the conditions. At the conferences President A. E. Potter, Superintendent R. R. Anderson and Attorney Whipple have represented the company.

Washington Strike Inquiry

Men Present Their Side—Company Now Engaged in Presenting Its Case

The Washington Railway & Electric Company, Washington, D. C., began on May 21 the presentation of its side of the case before the Senate committee which is inquiring into the recent strike of the employees of the company. The company called as the first witness George A. Wilburt, president of the Washington branch of the Amalgamated Association. Counsel established, through Mr. Wilburt's testimony, that District Commissioner Newman had been advised that the railway employees would not insist upon their demands for the closed shop and recognition of the union, provided other demands satisfactory to the men were allowed. Counsel also brought out that Mr. Wilburt had not availed himself of the opportunity for a final conference with President King of the company, because that conference was to have dealt only with the individual contracts proposed by the company. Counsel of the company then sought to show that the by-laws of the parent association were not lived up to in the letter of the law in the preliminaries to calling the strike.

UNION PRESIDENT'S TESTIMONY

It was developed by the testimony that President King of the Washington Railway & Electric Company would not deal with any committee of the Amalgamated, but would treat only with a committee of the men not representing that organization. Counsel questioned the witness to try to bring out that Mr. King would have been glad to receive the grievance committee of the men, but the witness clung to the statement that Mr. King wanted to talk about the individual contract, which, in the opinion of the witness, was of a character that made discussion of it useless, from the viewpoint of the union men. Later Mr. Wilburt admitted that he had said publicly that the conferences were over because Mr. King had refused to recognize the union. Subsequently he said that while the men wanted the union recognized, and favored the closed shop, still they would not cause a strike on refusal of these demands alone, provided other concessions were made, but that Mr. King would not discuss these matters. Mr. Wilburt's authority for this statement was questioned by counsel for the company. He did not understand that the Amalgamated was committed irrevocably to the principle of the closed shop. Senator Johnson pointed out that the contract of the Amalgamated with the Capital Traction Company demonstrated that fact. Mr. Wilburt also reviewed his career with the company since the date of his employment in 1908.

The committee resumed its session on the night of May 22. It will not sit while the Senate is in session.

THE MEN'S SIDE

In presenting their side of the case the men sought to show that the company had since the strike re-employed forty-eight men discharged previously from its service. The men also introduced what purported to be a statement of the terms under which new men were engaged at the outset of the strike to replace the men who went out.

Commissioner Oliver P. Newman, of the District, testifying before the committee on May 10, said that before the employees went on strike last March the commissioners were authorized by them to waive, in the proposed negotiations or mediation between the company and the men, the recognition of the union. Mr. Newman also told the committee that the commissioners did not state this fact to the officials of the company. Explaining the reasons of the commissioners for not making the direct statement that the men were ready to waive the demand for recognition of the union in the negotiations, Mr. Newman said: "The men wanted recognition, and asked us not to tip their hand to the company."

Mr. Wilburt, on the other hand, insisted that President King would not have agreed to mediation even if Commissioner Newman had told him the men were ready to waive recognition in the negotiations. As stated previously, his authority for this statement was questioned by counsel for the company.

St. Paul to Rush Electrification

The Chicago, Milwaukee & St. Paul Railway plans to complete the electrification of its line from Cle Elum, Wash., west, one year earlier than expected. The Puget Sound Traction, Light & Power Company has been advised by the St. Paul that it will be expected to furnish electric current from its hydroelectric and steam plants by Sept. 1, 1918. Survey crews and materials have been moved from Othello to South Cle Elum, and preliminary work will be started immediately, thus postponing work on the Columbia division. The reason for the change in plans, according to C. A. Goodnow, who is supervising the work, is the constantly increasing price of oil. The company must use oil in the locomotives passing through the forest reserves in the mountain on the Columbia division, while coal-burners can be employed between South Cle Elum and Othello without danger. The survey along the proposed line of the Columbia division has been almost completed, and setting of pole lines and building of substations is to start soon.

The contract of the Chicago, Milwaukee & St. Paul Railway with the Puget Sound Traction, Light & Power Company calls for a minimum of 13,000 hp., or the equivalent of one unit at the White River plant. The company has been working on plans for an increase in the capacity of the White River station, where two new units will be ready next spring, giving 23,000 hp. additional, and it is probable that an extra order for development at White River will be placed in time to permit the work to be completed before the St. Paul's western division is electrified. The present contract with the railroad calls for the delivery of current by the traction company at the Snoqualmie Falls plant.

CAPACITY USE OF STEAM PLANTS CONTEMPLATED

While the four steam plants of the Puget Sound Traction, Light & Power Company were used comparatively little during the past winter, orders have been placed to get all four ready for capacity use next winter, indicating the company's estimate of the immediate development of business within its territory. Its steam plants are located at Everett, Tacoma, and at Georgetown and Post Streets, Seattle. The present capacity of the company's water-power plants is as follows: White River, 33,000 hp.; Electron, 25,000 hp., and Snoqualmie, 25,000 hp.

The Chicago, Milwaukee & St. Paul Railway will expend $6,000,000 in making the change from coal to electricity between Othello and the coast. It will have 640 miles of track electrically operated.

The company has recently awarded to the Brick & Tile Delivery Company, Seattle, a contract for 3,000,000 bricks to be used in connection with the construction of substations every 30 miles along the line.

Hydroelectric Power Helpful

That hydroelectric energy is proving a substantial help in the solution of the fuel problem in street railway power plants was stated by C. V. Wood, president of the Springfield Street Railway, at a hearing on May 3 before the Massachusetts Waterways Board. The commission was considering a petition of the Turners Falls Power & Electric Company for authority to build an additional 66,000-volt line across the Connecticut River at Springfield for the supply of electricity to the Springfield Street Railway according to the terms of a contract recently closed between the two concerns. Mr. Wood said that delays in fuel supply last winter had several times brought the road within twelve hours of a shut-down. It is hoped that by 1919 all the energy required by the road will be supplied from the Turners Falls system, which will shortly be increased in capacity by the construction of a $2,000,000 auxiliary steam turbine plant at Chicopee Junction, Mass. The Springfield Street Railway would be obliged to expend $1,500,000 if it enlarged its power plant facilities itself. Bentley W. Warren, counsel for the Massachusetts Street Railway Association, also spoke on behalf of the purchase of power by street railways. He then emphasized the present difficulties in obtaining capital for electric railway power plant extensions.

Bridge Negotiations Continue

City of Seattle and Puget Sound Company Still Conferring Over Bridge Contract

Negotiations between the city of Seattle, Wash., and the Puget Sound Traction, Light & Power Company, relating to the use of the Fremont bridge by the company, came to a deadlock when Councilman Erickson, chairman of the Council committee of three in charge of the negotiations, announced that no proposition would be considered for the use of the bridge by the company that did not carry with it the right of the city to operate its cars over the Third Avenue tracks of the company. A. W. Leonard, president of the company, declared that the company had a franchise right to operate over the Fremont Avenue bridge, whereas the city was asking something for which it had no legal right. He insisted that the two questions were distinct, and should be considered separately.

CITY SUGGESTS YEARLY RENTAL

A. H. Dimock, city engineer, and A. L. Valentine, superintendent of utilities for the city, submitted a report suggesting that a yearly rental of $7,568 plus one-third the cost of operation and maintenance be charged the company for the use of the bridge. The company's engineer refused to concur in this finding. Mr. Leonard said that the company stood ready to pay a fair cash rental, but Councilman Erickson insisted that a cash rental would not be considered unless the company would fix a rate for the operation of city-owned cars over the tracks of the company. Mr. Leonard intimated that the company would not agree to the use of its tracks for city cars, but would be willing to take over both Division A and the Lake Burien branch of the municipal railway, and operate them in connection with the company's system.

Mayor Gill said that he was disposed to favor an arrangement whereby the company would take over the Nickerson Street line from the city, provided the company extended it to Ballard. He said that the matter should not involve the exchange of transfers or any other issue. The important thing was to provide service for the 50,000 patrons living north of the bridge.

The City Council later passed a resolution requesting the Mayor and the Board of Public Works to prohibit the company from operating over the Fremont bridge.

BRIDGE TO OPEN JULY 1

The bridge will probably not be opened for traffic until July 1. In the meantime, conferences between officials of the company and the city committee will continue, looking toward an adjustment of the several matters in hand. The importance of the bridge as a link between the north and south ends of Seattle as divided by the Lake Washington canal, is shown by reports of A. L. Valentine, superintendent of utilities, indicating that 1275 cars will operate over that structure every twenty-four hours, when the Stone Avenue bridge is removed, making a total of 465,375 cars a year.

Atlanta Fire Damage

Loss of More Than $75,000 Sustained by the Georgia Railway & Power Company—Lighting and Railway Service Restored Quickly

Seven electric railway lines of the Georgia Railway & Power Company, Atlanta, Ga., serving the entire northeastern quarter of the city, were put temporarily out of commission by the great fire that swept Atlanta on May 21. The damage sustained by the company is estimated at more than $75,000. This figure represents $25,000 injury done to the railway department and $50,000 to the lighting and commercial and the arc circuits. Throughout the burned area, which comprised more than seventy city blocks, poles and wires and transformers and insulators were reduced to charcoal and junk. In addition to these positive losses, the radical and sudden reduction of receipts from the residence sections that the flames reduced to a stark wilderness was considered a further item of injury to be charged to the fire. Notwithstanding these losses, the Georgia Railway & Power Company headed the list of subscribers to the city's relief fund with a gift of $2,500.

Immediately after it became apparent that the fire was beyond the control of the local firemen, plans for localizing its effects were applied by the company, with the result that trolley and other electric services continued normal and without interruption in all other parts of the city. Just as soon, however, as the local fire department and the assisting fire fighters rushed to Atlanta by special trains mastered the flames, the company began its work of restoring service into and beyond the desolated area. Within less than twenty-four hours after the fire reached its height, lighting circuits and arc circuits were alive once more and the first of the interrupted trolley lines had resumed service much further toward its terminus.

SERVICE CUT OFF TEMPORARILY FROM BURNED AREA

In consequence of the fact that several railway lines crossed the burned area or lay largely within it a very much larger section of the city than was burned was deprived temporarily of all street railway service. Restoration of car service entailed practically the complete rebuilding of everything except the tracks. Ten cars were trapped by the flames, but were rushed out of the danger zone and parked at points of comparative safety beyond the fire to await the time when they could proceed with their own motors again.

The operation of each of the railway lines in the fire area was continued until in sequence one after the other was stopped by the flames. Numerous instances were reported of residents throwing their valuables into or upon outgoing cars in order to save them from the rapid advance of the fire.

For a time two large carhouses of the Georgia Railway & Power Company were threatened. They were on the western edge of the fire's wide path. The company suffered a $2,000 loss in the burning of a shed occupied by roadway men and work cars. The company's car-building and repairing plant on Tenth Street was just beyond the northeastern extremity of the fire's reach and for several hours was in danger from sparks. It was expected on May 22 that all damage sustained by the company would be repaired by May 26.

Seattle Settlement Terms Filed

All Litigation with Seattle & Rainier Valley Railway Settled Except One Suit

Nine acceptances on the part of the Seattle & Rainier Valley Railway, Seattle, Wash., necessary to complete the settlement of all differences between the company and the city of Seattle, were filed recently. They were signed by Marshall E. Sampsell, president, and Walter M. Brown, secretary and manager of the company. By the provision of the various ordinances and the acceptances by the company of their terms, all litigation between the company and city is dismissed with the exception of the suit brought by the city to recover 2 per cent of the gross earnings of the property during the period that the line was operated without a franchise. Some of the provisions of the ordinances are as follows: Exchange of transfers between the Rainier and city lines, common-user rights to the city on Fourth Avenue, between Stewart and Jefferson Streets; company to extend its lines on Genesee Street, abandon its line on Stewart Street between Fourth and Fifth Avenues, and build a turning track on Fourth Avenue north of Stewart Street; service on Dearborn Street, abandoned when regrade was taken up several years ago, to be resumed; cars to be operated from Seattle Boulevard to Dearborn and on Fourth Avenue from Washington Street to Seattle Boulevard on the tracks of the Puget Sound Traction, Light & Power Company, and tracks on Washington Street between Fourth and Thirteenth Avenue South to be abandoned.

A judgment of $41,700, awarded by the United States Court in favor of the company and against the city for private right-of-way taken and changing of grades of Rainier Avenue, will be satisfied by the city as part of the general settlement agreement.

Senate Passes Bill to Increase I. C. C.—The Senate has passed the bill increasing the membership of the Interstate Commerce Commission from seven to nine.

Meetings in Springfield Carhouse.—The Springfield, (Mass.) Street Railway on Monday, May 21, entertained the Board of Trade of that city at a noon-day luncheon at its new carhouse. On Tuesday the Mayor and the members of the City Council paid a visit of inspection to the building. The Rotary Club of Springfield was invited to hold a meeting in the carhouse on Friday, May 25.

Strike at Alliance Reported Settled.—The indications on the afternoon of May 22 were that the strike of motormen and conductors on the Stark Electric Railroad and the Cleveland, Alliance & Mahoning Valley Railroad would be settled. It is stated unofficially that the company has agreed to recognize the union, increase wages 5 cents an hour and reinstate four or five men who had been discharged.

Bonus to Meet High Cost of Living.—The Omaha & Council Bluffs Street Railway, Omaha, Neb., has announced it will pay to 1200 employees earning $100 a month or less a "high cost of living bonus" of 6 per cent of wages earned from Jan. 1 to July 1, 1917. The bonus will be paid on July 15 to employees in the service of the company the entire six months, with the exception of men in the power department, whose wages recently were readjusted. The company estimates that the bonus will amount to $25,000.

Wage Increase in Guelph.—On May 15 the employees of the Guelph (Ont.) Municipal Street Railway were informed that their wages would be increased to 25 cents an hour for a sixty-eight-hour week. The men had asked for 30 cents an hour to correspond with other civic employees. The municipality pointed out that the other employees did not receive full time. This is the fourth increase which has been made in the wages of the men during the last twelve months. A year ago the men were receiving 21 cents an hour.

Village Wants to Negotiate After Road Is Built Around It.—The Village Council at Berea, Ohio, has instructed City Solicitor S. W. Green to negotiate with the Cleveland, Southwestern & Columbus Railway in an effort to settle the question of operation of cars through the town, and has agreed to ratify any arrangement he may make, provided it is subject to a referendum vote. The company has recently completed tracks around the town. The trouble between the village and the company arose over the fare between Berea and Cleveland.

Dallas Ordinances to Be Contested.—Dallas traction interests will contest in the courts the recent municipal election at which three ordinances initiated by the Socialists were adopted, according to Edward T. Moore, vice-president and general manager of the Dallas Consolidated Electric Street Railway. These three ordinances are the jitney ordinance, initiated by the Jitney Drivers' Association; the ordinance requiring an eight-hour day for corporation employees, including employees of street railways, and the ordinance requiring safety appliances on street cars.

Differences Settled in Albany.—The differences between the trainmen and the officials of the United Traction Company, Albany, N. Y., over the interpretation of certain sections of the working agreement pertaining to the operation of extra cars have been satisfactorily adjusted, as a result of several conferences between the officials of the company and representatives of the men. A settlement was finally reached by both sides adopting a set of station rules and regulations embodying the rights of the company in the use of its extra men.

McAlester Adjustment for Two Years.—The agreement entered into between the Pittsburg County Railway, McAlester, Okla., and its employees, to which reference was made in the Electric Railway Journal of May 19, will govern the hours of duty and the scale of wages for a period of two years, dating from May 1. As stated previously the matter was adjusted on the basis of the payment of an average increase of 3 cents an hour to all classes of employees represented. The men demanded 4 cents an hour advance, while the company announced its willingness some time ago to grant an increase of 2 cents.

Park Amusements Destroyed.—Thirteen amusement places at Woodside Park, Philadelphia, Pa., were destroyed by fire on May 20. The amusement attractions were owned by the concessionaries and the loss to them is estimated unofficially at $160,000, covered largely by insurance. The park itself is owned and controlled by the Fairmount Park Transportation Company. The park is on the edge of famous Fairmount Park and is one of the city's most popular resorts. It was opened for the summer on May 5. The amusements which were not damaged will be continued in operation and the ones that were destroyed will be rebuilt or replaced.

Conferences Proposed on East Cleveland Franchise.—Officers of the Cleveland (Ohio) Railway have announced that conferences will be held shortly with city officials of East Cleveland in an endeavor to settle several small differences which have arisen since the tentative agreement was reached some time ago. The Council has not yet acted upon the franchise and there may be some hesitancy, since the city of Cleveland, which has control of the service on the Cleveland Railway, has refused to improve the service between Lakewood and the city, although the fare is 5 cents. Officials of the latter suburb asked that the cars running to it be marked "Lakewood—Fare 5 Cents," in order that the Lakewood cars may not be overcrowded with passengers who do not ride to the suburb. Half of the cars run on the Lakewood route are turned back at the city limits.

Shortage of Labor in Buffalo.—Unable to get sufficient men to operate its cars, the International Railway, Buffalo, N. Y., has been forced to withdraw a number of runs. Every effort is being made to secure platform men. Large display advertisements are being used not only in Buffalo but in Niagara Falls, Lockport and other western New York cities. Many employees have resigned to accept positions at higher pay in steel mills and other industries, while others have joined the military forces. Owing to the labor situation, the company has been forced to secure women to clean cars in several of the carhouses. The women receive the same pay as the men. A very large percentage of the company's employees is subject to the selective draft. The company has made no announcement as to whether it will try women as fare collectors.

Service of I. U. T. Normal Again.—Officials of the Union Traction Company of Indiana report that there is now no interruption to the normal service on all the interurban and city lines of the company due to the walkout of about thirty-six interurban trainmen when a strike was called by the Brotherhood of Locomotive Engineers and Order of Conductors on May 13. Vernon Hinkle, deputy president of the Order of Railway Conductors, made public a statement on May 19 setting forth the claims of the brotherhoods and the arrangements made in Muncie, Anderson, Marion, Tipton and other cities for parades and demonstrations for the purpose of bringing their case before the other employees of the Union Traction Company. He asserts that the service of the company is crippled and that "the fight on the property will continue until all of the men working are taken out on strike."

Settlement of M. C. B. Exhibit Arrangements.—Owing to the abandonment of this year's convention of the American Master Mechanics' Association and Master Car Builders' Association, the Railway Supply Manufacturers' Association had to terminate its contracts made at Atlantic City in anticipation of the convention. It did this by having these contracts carried over to 1918 on the same terms and prices, thus reducing the direct loss for the exhibition account to less than $700, instead of a possible $10,000 or $12,000. As some payments had to be made to the contractors on account of these suspended contracts, the executive committee will withhold 50 per cent of the amount paid for exhibit space in the 1917 convention and refund 50 per cent. The Atlantic City Hotel Men's Association, C. M. Koury & Company, furniture, and J. J. Habermehl's Sons, decorations, have also accepted the cancellation of each individual member's order. As under the constitution of the Railway Supply Manufacturers' Association all officers continue until their successors are elected and qualify, the officers and executive committee members of this year will carry over until next year.

Wage Increase Under Consideration in Chicago.—The demands of the employees of the Chicago (Ill.) Surface Lines and the Chicago Elevated Railways for increased wages, as outlined in the Electric Railway Journal for May 12, were formally presented to the surface lines on May 16 and to the elevated lines a few days in advance of this. The companies were expected to make answer about May 24. An ordinance was introduced in the City Council by J. C. Kennedy, a Socialist Alderman, on May 21, for the appointment by the Mayor of a board of examiners of three members, and that no one shall be permitted to act as a motorman or conductor without first obtaining a license from this board. A penalty clause is attached providing for a fine of from $10 to $200 for failure to obtain such a license, and this fine may be assessed against the company as well as the employees. The ordinance was referred to the judiciary committee of the Council.

Mediation Board to Try to Settle South Bend Strike.—Governor Goodrich of Indiana announced on May 19 that he will appoint a special mediation and conciliation board to attempt to settle the difference between the Chicago, South Bend & Northern Indiana Railway and those of its employees on the South Bend city lines who went out on strike on April 29. The new board will be appointed under the State voluntary arbitration law, and will be known as a "mediation and conciliation board," the company having recently refused to accept the appointment of an arbitration board. It rejected the idea of an arbitration board on the ground that it was operating all its lines; that the differences with its employees in other cities and on other divisions had been amicably settled, and that the trainmen who are out on strike had received an opportunity to return to work under the conditions accepted by their fellow employees, and had failed to take advantage of this offer. The Governor's action was taken after receipt of a letter from Mayor Keller of South Bend stating that he believed the differences could be settled by such a board.

Recess Inquiry Into Street Railway Problems in Massachusetts.—The committee on rules of the Massachusetts Legislature has reported a resolve in favor of an investigation of the economic condition of street railways in the State by a recess commission during the coming summer. In commenting editorially upon this, under the caption "Investigations Worth Making," the Boston *Transcript* said in part: "The suggestion is deserving of adoption. The State cannot rightly avoid taking a hand to attempt the solution of the street railway problem. Facing a steady reduction in revenue, as the costs of construction and operation steadily rise, the electric lines must find relief. Their only alternatives are curtailment of service, permission to increase their rates, reduction of taxes and the grant of similar special concessions, or outright State ownership, which would have the probably unhappy result of throwing the burdens on the taxpayers. The public must prepare itself to determine which of these alternatives it will allow. We are in for a campaign of education concerning these matters of transportation, and the sooner we complete it the better."

Programs of Association Meetings

Central Electric Railway Association

In conformity with its pledge of full service to the government the Central Electric Railway Association has annulled its summer boat trip meeting scheduled for June 22 to 25 so that the members may devote their endeavors to the maintenance of high operating standards on their own properties.

Public Relations "Round Table"

J. C. Davidson of the Denver (Col.) Tramway is urging all publicity managers, public relations men, general managers and others directly connected with public relations work to attend the "Round Table" of their profession at the convention of the Associated Advertising Clubs of America at St. Louis, Mo., on June 3 to 7. The purpose of the "Round Table" is to exchange publicity and public relations methods and ideas with the object of increasing the efficiency of such work. No set program of papers has been arranged. The Hotel Jefferson will be the headquarters of the clubs. Delegates are requested to have facts, figures and examples of work with them. Additional information may be obtained by addressing Mr. Davidson at 807 Tramway Building, Denver, Col.

Financial and Corporate

Annual Reports

United Railways & Electric Company

The statement of income, profit and loss of the United Railways & Electric Company, Baltimore, Md., for the year ended Dec. 31, 1916, follows:

Operating revenues	$9,914,051
Operating expenses and taxes (including depreciation)	6.058,492
Operating income	$3,855,559
Non-operating income	92,000
Gross income	$3,947,559
Deductions from gross income:	
Rents	$410,088
Interest on funded debt	1,822,393
Interest on income bonds	559,080
Amortization of discount on funded debt	19,789
Miscellaneous	28,085
Total deductions	$2,839,435
Net income	$1,108,124
Profit and loss credits	105,967
Gross profit and loss surplus for year	$1,214,091
Profit and loss debits:	
Dividends on common stock	$818,448
Dividends on preferred stock	920
Miscellaneous appropriations of surplus	178,710
Miscellaneous debits	112,578
Total debits	$1,110,656
Undistributed profit for year	$103,435
Profit and loss surplus at Dec. 31, 1915	1,008,058
Total profit and loss surplus	$1,111,493

Effective Jan. 1, 1916, the company adopted the revised classification of accounts prescribed by the Public Service Commission of Maryland, and the figures displayed above are in accordance therewith. Under this classification depreciation is charged as an operating expense. Following are the results for 1916 compared with those for 1915, the figures for the latter year having been revised:

	1915	1916	Increase	Per Cent Increase
Operating revenues	$8,980,710	$9,914,051	$933,341	10.39
Operating expenses	4,102,766	4,567,949	465,183	11.34
Depreciation	410,548	495,702	85,154	20.74
	$4,513,314	$5,063,652	$550,338	12.19
Taxes, licenses, etc.	904,675	994,840	90,165	9.97
	$5,417,989	$6,058,492	$640,503	11.82
Ratio of operating expenses to operating revenues:				
	Per Cent	Per Cent		
Operating expenses	45.68	46.08	......	0.40
Depreciation	4.58	5.00	......	0.42
	50.26	51.08	......	0.82

After paying all expenses and charges of every character, and after crediting the usual amount to regular reserve accounts, the company in 1916 earned $288,755 more than the amount required for the 4 per cent dividend on the common stock. Of this sum $157,500, representing the company's total investment on account of the "jitney" companies, was set aside as a reserve. There remained, after further adjustments, the sum of $103,435, which was entered to "undistributed profit."

The increases in gross and net over 1915 were considerably above normal. The year 1915 was a relatively poor one for the company. There were two main causes—depressed industrial conditions existing during the greater part of that year which affected Baltimore as well as other cities, and the unregulated jitney competition prevailing during a greater part of the year. The situation after that time materially changed. Beginning with the fall of 1915 there was a revival of activity and the city entered upon a period of rapid and substantial industrial development. Within the last year and a half it is estimated that there was expended or provision was made for the expenditure of sums aggregating more than $125,000,000 around the port of Baltimore for the establishment of new industries or for the expansion of existing industries.

To solve the jitney problem the railway invested in the stock of two separate companies, one operating jitneys and the other a bus line on one of the principal thoroughfares not provided with direct car service. The experience of the railway with this means of transportation was identical with that of others in the same field, and it has been demonstrated conclusively that, under existing conditions, these lines cannot be operated with profit at a 5-cent fare. The jitney company, therefore, has practically ceased operation, but the bus line has been continued for the convenience of the public.

The railway's total investment in the stocks of these companies and its contingent liability as indorser of the notes of the two companies amounts to $157,500. This whole sum, as before stated, was set up as a reserve against earnings for 1916. The total cost of this venture, therefore, can be charged off against income for 1916. At the present time there are but few jitneys in operation in Baltimore.

For maintenance of way, structures and equipment, there was charged to operating expenses during 1916 $834,116, which with the $495,703 credited to depreciation reserve and included in operating expenses, makes a total of $1,329,819, an increase of $199,992. The total taxes and public charges in 1916 paid by the company were $1,158,590. This represents the total net earnings (after paying costs of operation only) of one car in every four. It also represents 11.69 per cent of the gross revenues.

Petaluma & Santa Rosa Railway

The gross earnings of the Petaluma & Santa Rosa Railway, Petaluma, Cal., for the calendar year 1916 amounted to $273,534, as compared to $283,047 the year before, while the operating expenses dropped from $201,151 in 1915 to $185,950 in 1916, so that the net earnings rose from $81,897 to $87,583. Moreover, the fixed charges showed a slight decrease from $62,363 in 1915 to $61,602 in 1916, with the result that the surplus gained from $19,534 in 1915 to $25,981 in 1916.

The passenger earnings decreased $8,692 during 1916, as compared to more than $10,000 in 1915. Up to 1915 the passenger earnings had shown a consistent increase. The principal cause of the decrease thereafter was the increase in the use of automobiles. Business conditions in 1916 were better in the company's territory, and the prices prevailing were high enough to offset a shortage in production, but the decrease in the production of many commodities made a corresponding decrease in tonnage for the railway. Moreover, both steamers of the company were tied up between June 1 and July 20, at the busiest time of the year, on account of a general strike of steamboat firemen and deck hands. While the entire decrease of $9,513 in gross earnings was probably attributable to the strike, the company suffered practically no net loss on account of it. Considerable business, however, was lost through the closing of the Panama Canal, inasmuch as the traffic moved via routes which eliminated the company from enjoying any part of the haul.

Considerable was accomplished during the year in reducing the cost of operation through a close attention to details and the development of greater efficiency. The net reduction in operating expenses amounted to $15,200, even after the inclusion of $10,934 on account of depreciation and compensation insurance, for which no charge was made prior to the last year. About $8,500 of the reduction was caused by the elimination of the expense of operating the steamers during the strike. Moreover, by a consolidation of the duties of president and attorney, and general manager and traffic manager, the salaries of general officers were reduced $2,300. More can perhaps be done along the line of economical efficiency, it is said, but a substantial increase in revenue is needed. The company will apply, as soon as it is possible to secure the necessary co-operation, for increases in rates which, it is believed, can be made without injuriously affecting its business and which will increase the revenue $20,000 or $30,000 a year.

Electric Railway Statistics

Expenses Shown to Be Increasing Faster Than Revenues, in Comparison of Returns for February, 1917, with Those for 1916

A comparison of electric railway statistics for February, 1917, with figures for the corresponding month of 1916, made by the information bureau of the American Electric Railway Association, indicates that the expenses of electric railways in the United States are increasing faster than the revenues. This condition is particularly noticeable in the East and has had a depressing effect upon the returns for the country as a whole. Data for February, representing 9123 miles of line of companies scattered throughout the country, figured on the per mile of line basis, indicate an increase in operating revenues of 3.18 per cent, in operating expenses of 8.95 per cent and a decrease in net earnings of 6.99 per cent. Data representing 7324 miles of line indicate an increase in the amount of taxes paid of 8.40 per cent and a decrease in operating income of 15.83 per cent. The returns from the city and interurban electric railways, as shown in detail in the appended table, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

Of the three groups shown in the accompanying table, re-

REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR FEBRUARY, 1917

Account	United States				Eastern District				Southern District				Western District			
	Amount, February, 1917	Per Mile of Line			Amount, February, 1917	Per Mile of Line			Amount, February, 1917	Per Mile of Line			Amount, February, 1917	Per Mile of Line		
		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase
Operating revenues	$17,478,709	$1,916	$1,857	3.18	$13,231,774	$2,096	$2,025	3.51	$1,237,286	$1,155	$1,130	2.21	$3,009,649	$1,732	$1,700	1 88
Operating expenses	11,767,872	1,290	1,184	8.95	9,027,325	1,430	1,288	11.02	725,178	677	660	2.57	2,015,369	1,159	1,130	2.56
Net earnings	5,710,837	626	673	†*6 99*	4,204,449	666	737	†*9.64*	512,108	478	470	1.70	994,280	573	570	0.52
Operating ratio, per cent	1917, 67.32; 1916, 63.76				1917, 68.22; 1916, 63.60				1917, 58.61; 1916, 58.40				1917, 66.91; 1916, 66.47			
Average number of miles of line represented	1917, 9,123; 1916, 9,018				1917, 6,314; 1916, 6,236				1917, 1,071; 1916, 1,067				1917, 1,738; 1916, 1,715			

COMPANIES REPORTING TAXES

Account	United States				Eastern District				Southern District				Western District			
Operating revenues	$13,177,857	$1,799	$1,776	1.29	$9,557,406	$1,878	$1,858	1.07	$719,237	$1,163	$1,136	2.37	$2,901,214	$1,793	$1,767	1.47
Operating expenses	9,192,46	81,255	1,164	7.81	6,851,589	1,346	1,227	9.69	405,425	656	636	3.14	1,935,454	1,196	1,170	2.22
Net earnings	3,985,389	544	612	†*11.12*	2,705,817	532	631	†*15.69*	313,812	507	500	1.40	965,760	597	597	0.00
Taxes	944,088	129	119	8.40	696,170	137	123	11.38	60,929	[illegible]	95	4.21	186,989	115	118	†*2.55*
Operating income	3,041,301	415	493	†*15.83*	2,009,647	395	508	†*22.25*	252,883	408	405	0.74	778,771	482	479	0.62
Operating ratio, per cent	1917, 69.76; 1916, 65.54				1917, 71.67; 1916, 66.04				1917, 56.40; 1916, 55.98				1917, 66.70; 1916, 66.21			
Average number of miles of line represented	1917, 7,324; 1916, 7,222				1917, 5,088; 1916, 5,009				1917, 618; 1916, 617				1917, 1,618; 1916, 1,596			

†Decrease. There were twenty-nine days in February, 1916, and only twenty-eight days in February, 1917.

turns for the Eastern representing 6314 miles of line are somewhat affected by the unsatisfactory conditions which have had to be faced by the electric railways operating within the limits of Greater New York. These railways have not only suffered a slight decrease in revenues but have had to meet a considerable increase in their operating expenses and taxes. Consequently, though conditions in other parts of the district were slightly better, the returns for the district as a whole indicate an increase in operating revenues of 3.51 per cent, in operating expenses of 11.02 per cent and a decrease in net earnings of 9.64 per cent. Returns representing approximately 80 per cent of the above mileage show an increase in the amount of taxes paid of 11.38 per cent and a decrease in operating income of 22.25 per cent. Returns for the Southern group representing 1071 miles of line and for the Western group representing 1738 miles of line, though showing a greater percentage increase in operating expenses than in operating revenues, still indicate a slight increase in net earnings. Companies in the Southern group represented by 618 miles of line indicate an increase in the amount of taxes paid of 4.21 per cent and in operating income one of 0.74 per cent. In the Western group the operating income increased 0.62 per cent.

The operating ratio for the country as a whole has increased from 63.76 in February, 1916, to 67.32 in 1917. The increase is due largely to the increase in the operating ratio of the Eastern district. Slight increases in the operating ratio of the Southern and Western districts have also occurred.

R., S. & E. Reorganization Plan

Committee Representing Bondholders of the Rochester, Syracuse & Eastern Railroad Announces Plan and Agreement of Reorganization

The bondholders' protective committee, of which Arthur W. Loasby is chairman, representing the Rochester, Syracuse & Eastern Railroad bondholders, has submitted to the holders of the first mortgage 5 per cent gold bonds of that company who have deposited their bonds a plan for the purchase of the property at foreclosure and for its reorganization. The plan and agreement for the reorganization are dated May 18. It is expected that a sale of the property under the judgment of the Supreme Court will be held in the near future in the action commenced at the request of the committee.

The committee says that the property as a whole is in good condition to be taken over and operated by the bondholders without the rehabilitation expenditures which frequently form a part of reorganization plans. As to what the bondholders may expect in net earnings, if the plan is carried out, the committee says that the property has had the benefit of a full year's operation under the management of C. Loomis Allen, the receiver, and that if the bondholders approve the plan submitted by the committee, Mr. Allen will be continued in the management of the property by the new corporation. The statement of the financial operations of the company for the year ended Dec. 31, 1916, shows gross earnings of $753,343 and the amount applicable to the payment of bond interest and dividends $218,604.

The committee has concluded that the property should be acquired and operated by the bondholders through a new company, and that the capitalization authorized for the purpose of acquiring the property should not exceed its actual value, $7,000,000, as follows: $3,000,000 of 6 per cent cumulative preferred stock, $1,000,000 of common stock and $3,000,000 of first mortgage 5 per cent bonds. The bondholders who participate in the plan will receive for each $1,000 par value of the old bonds securities of the new company as follows: $500 of first mortgage 5 per cent bonds, $500 of 6 per cent cumulative preferred stock, $200 of common stock and $100 additional of 6 per cent cumulative preferred stock representing unpaid interest.

The amount of the old bonds outstanding was $4,896,000. If the holders of all of these bonds participate in the new plan the total amount of securities of the new company outstanding will be $2,448,000 of bonds, $2,937,600 of preferred stock and $979,200 of common stock, or a total of $6,346,800. The plan further provides that such of the authorized securities of the new company not required for delivery to participating bondholders shall be delivered to the committee to be used by it to raise the necessary cash to pay the non-participating holders. The amount of the bonds which will be issued by the new company will be not less than $2,448,000 and not more than $3,000,000.

It is pointed out that the net earnings of the company during the first year of its operation will probably exceed the amount required for interest upon the bonds by from $70,000 to $100,000, which will be applicable to dividends upon the preferred stock. The committee says that it is expected that there will ultimately be available to the participating certificate holders approximately $500,000 in possession of the Columbia Trust Company, the trustee of the mortgage, and of Mr. Allen and Mr. Holden, the receivers of the company. The committee reserves its decision as to how it shall apply this money, but points out that the fewer the dissents from the plan of reorganization the more likely it becomes that this money or some part of it may be devoted to paying the interest in default or some part of such interest. No assessment of cash is to be made upon the bondholders for the organization of the new company or the operation of the property.

Cumberland County Power & Light Company, Portland, Maine.—The Cumberland County Power & Light Company has applied to the Maine Public Service Commission for authority to issue $440,000 of bonds of which $207,700 are to be used for improvements during 1917. The commission has authorized the Portland Railroad, controlled by the Cumberland County Power & Light Company to issue $297,000 of first lien and consolidated mortgage bonds, making $2,147,000 outstanding.

Havana Electric Railway, Light & Power Company, Havana, Cuba.—The stockholders of the Havana Electric Railway, Light & Power Company have approved the plan to increase the preferred capitalization from $15,000,000 to $21,000,000. The holders of common and preferred stock of record of March 28 have the privilege to subscribe to the new stock, on the basis of 20 per cent of their holdings, at par and an amount equivalent to the accruing dividend thereon to June 15, making a total of $101.25 per share for the new preferred. Payments for the stock must be made on or before June 15.

International Railway, Buffalo, N. Y.—The New York Public Service Commission for the Second District has authorized the issue by the International Railway of $1,500,000 of the company's refunding and improvement 5 per cent bonds. The proceeds will be used to finance the extensions and improvements to the company's lines and additions to its rolling stock during the year 1917 and to refund $25,000 of car trust certificates due this year. Most of the projects provided for in the company's schedules have already been made public. They include the purchase of fifty-five new cars, improvement to the equipment of present cars, track reconstructions and extensions and additions to the power house and substation equipment.

Lehigh Valley Transit Company, Allentown, Pa.—The agreement seeking the deposit of the stock of the Lehigh Valley Transit Company in connection with the deal involving consolidation with the Lehigh Navigation Electric Company has been extended for ninety days from May 7. On May 12, $3,385,250 of preferred stock and $2,288,000 of common stock deposit receipts had been listed on the Philadelphia Stock Exchange.

Los Angeles (Cal.) Railway.—The operating revenues of the Los Angeles Railway for the year ended June 30, 1916, totaled $6,101,792, and the operating expenses $4,136,660. The revenue per car-mile for this year was 20.71 cents, and the operating expenses per car-mile 14.01 cents. The revenue per mile of track totaled $16,671.

New York (N. Y.) Railways.—The holders of bonds aggregating $2,000,000 of the former Twenty-eighth & Twenty-ninth Streets Crosstown Railway cannot sue the New York Railways in the New York federal courts, according to a decision handed down in the Supreme Court of the United States. The bonds were guaranteed by the Metropolitan Street Railway. After the Metropolitan Street Railway became insolvent, suit was brought in the United States District Court at New York for the recovery of the principal of the bonds, the complainants contending that the New York Railways was liable therefor. The District Court refused so to hold, questioning its jurisdiction in the matter. The case was carried to the United States Supreme Court, and the decision of the lower court affirmed. The Third Avenue Railway is now operating the Twenty-eighth & Twenty-ninth Streets Railway, which has been reorganized as the Mid-Crosstown Railway. B. F. Wollman, president Bleecker Street & Fulton Ferry Railroad, has announced that the sale of the stock of that company to the New York Railways has been consummated and that more than 85 per cent of the stock has been delivered. The purchase of the stock of the New York Railways was made with the approval of the Public Service Commission for the First District at $28.50 a share.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The Oakland, Antioch & Eastern Railway has filed with the California Railroad Commission an application for authority to renew promissory notes for a total of $400,000. Of these notes, $240,000 are to the Union Trust Company, San Francisco, Cal., and draw interest at 6 per cent; $19,053 are to the J. G. White Engineering Corporation, and bear interest at 6 per cent; $47,800 are to the United States Steel Products Company, and are 6 per cent notes; and $93,000 are to the Anglo-London-Paris National Bank, and bear the interest rate of 7 per cent.

Syracuse & Northern Electric Railway, Syracuse, N. Y.—The New York Public Service Commission for the Second District has approved of the reorganization of the Syracuse & South Bay Electric Railroad and the Syracuse, Watertown & St. Lawrence River Railroad as the Syracuse & Northern Electric Railway, in accordance with an agreement reached with a committee of the bondholders composed of F. W. Roebling, Jr., W. L. Smith and William Nottingham. The new company has been authorized to issue $40,000 of first lien notes, $153,750 of second mortgage bonds, $480,000 of first preferred 6 per cent non-cumulative stock, $420,000 of second preferred 6 per cent non-cumulative stock and $150,000 of common stock. This makes the total capital liabilities $1,243,750, as against $1,790,000 of securities of the two old companies. The committee on reorganization says in its petition that the new arrangement will reduce the fixed charges on the property to a point where its undoubted value in construction, equipment and territory will enable the new company to live.

Tidewater Power Company, Wilmington, N. C.—Hugh MacRae, president of the Tidewater Power Company, has written to the ELECTRIC RAILWAY JOURNAL relative to the proposed sale of the property of the company to Brooks & Company, Scranton, Pa., to the effect that for reasons mutually satisfactory the transaction was not consummated.

Trans-St. Mary's Traction Company, Sault Ste. Marie, Mich.—A receiver has been appointed for the Trans-St. Mary's Traction Company. The company defaulted in the payment of the interest due on Jan. 1 on its fifteen-year 5 per cent bonds as noted in the ELECTRIC RAILWAY JOURNAL of April 7, page 664.

Washington Railway & Electric Company, Washington, D. C.—In accordance with the approval received from the District of Columbia Public Utilities Commission for the issue of $1,127,000 of general improvement 6 per cent debenture bonds, the Potomac Electric Power Company offers for sale $750,000 of the bonds, and will receive subscriptions until noon May 31. The proceeds will be used for extensions, additions, betterments and improvements and to reimburse the company for previous expenditures. The bonds are guaranteed by the Washington Railway & Electric Company, which controls the Potomac Company.

West Virginia Traction & Electric Company, Wheeling, W. Va.—William P. Bonbright & Company, Inc., New York, N. Y., reported on May 17 that they had already sold more than $1,000,000 of the $1,800,000 of 6 per cent secured notes of the West Virginia Traction & Electric Company, underwritten by them, since making their private offering of these notes on May 1.

Dividends Declared

Baton Rouge (La.) Electric Company, 3 per cent, preferred; 4 per cent, common.

Cities Service Company, New York, N. Y., monthly, one-half of 1 per cent, common and preferred; one-half of 1 per cent common, payable in common stock.

Citizens Traction Company, Pittsburgh, Pa., $1.50.

Northern Texas Electric Company, Fort Worth, Tex., quarterly, 1 per cent, common.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.						
1m., Mar.,	'17	$71,203	*$40,566	$30,637	$18,646	$11,991
1 " "	'16	63,794	*35,896	27,898	17,653	10 245
12 " "	'17	852,167	*480,147	372,020	218,071	153.949
12 " "	'16	792,384	*416.006	376,378	212,798	163,580
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS						
1m., Mar.,	'17	$8,412	*$9,857	†$1,445	$1,167	†$2,612
1 " "	'16	7,096	*8,465	†1,369	1,101	†2,470
12 " "	'17	125,302	*114,195	11,107	13.446	†2,339
12 " "	'16	116,967	*98,618	18,349	13,384	4,965
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.						
1m., Mar.,	'17	$106,691	*$74,631	$32,060	$29,753	$2,307
1 " "	'16	100,095	*60,568	39,527	29,793	9,734
12 " "	'17	1,248,917	*858,529	390,388	358,238	32,150
12 " "	'16	1,142,425	*737,509	404,916	357,353	47,563
COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS. OHIO						
1m., Mar.,	17	$332,389	*$237,777	$94,612	$45,109	$49,503
1 " "	'16	288,094	*169,962	118,132	44,375	73,757
12 " "	'17	3,657,467	*2,287,687	1,369,780	520,841	848,939
12 " "	'16	3,201,382	*1,891,333	1,310,049	489,482	820,567
CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.						
1m., Mar.,	'17	$236,387	*$166,137	$70,250	$66,629	$3,621
1 " "	'16	209,374	*139,620	69,754	66,371	3,383
12 " "	'17	2,938,421	*1,869,863	1,068,558	810,460	258,098
12 " "	'16	2,692,080	*1,568,691	1,123,389	802,370	321,019
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.						
1m., Mar.,	'17	$287,052	*$183,819	$103,233	$64,662	$38,571
1 " "	'16	231,887	*141,868	90,019	63.645	26,374
12 " "	'17	3,186,789	*1,955,131	1,231,658	760,429	471,229
12 " "	'16	2,563,131	*1,532,202	1,030,929	753,772	277,157
EL PASO (TEX.) ELECTRIC COMPANY						
1m., Mar.,	'17	$108,183	*$67.849	$40.334	$5,114	$35,220
1 " "	'16	86,491	*47.941	38.551	4,810	33,740
12 " "	'17	1,163,578	*713,531	450,047	60,593	389.454
12 " "	'16	1,014,837	*531,703	483,134	51,960	431,174
JACKSONVILLE (FLA.) TRACTION COMPANY						
1m., Mar.,	'17	$61,510	*$38,338	$23,172	$15.777	$7,395
1 " "	'16	54,731	*36,762	17,969	15,440	2,529
12 " "	'17	643,882	*431,016	212,866	185,832	27,034
12 " "	'16	612,704	*426,044	186,660	180,181	6,479
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.						
1m., Mar.,	'17	$67,227	*$53,586	$13,641	$15,679	†$2,038
1 " "	'16	55,204	*45,072	10,132	16,155	†6,023
12 " "	'17	828,722	*587,706	241,016	186,001	55,015
12 " "	'16	747,892	*490,819	257,073	191,224	65,849
NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.						
1m., Mar.,	'17	$201,328	*$137,091	$64,237	$40,906	$23,331
1 " "	'16	194,038	*121,775	72,263	42,807	29,456
12 " "	'17	2,415,890	*1,494,407	921,483	503,298	418,185
12 " "	'16	2,189,901	*1,349,511	840,390	513,680	326,710
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.						
1m., Mar.,	'17	$25,394	*$20,529	$4,865	$7,278	†$2,413
1 " "	'16	25,725	*15,955	9,770	7.188	2,582
12 " "	'17	311,898	*226,956	84,942	86,404	1,462
12 " "	'16	294,586	*178,666	115,920	90,057	25,863
PENSACOLA (FLA.) ELECTRIC COMPANY						
1m., Mar.,	'17	$25,220	*$15,999	$9,221	$7,818	$1,403
1 " "	'16	24,056	*13,315	10,741	7,516	3,225
12 " "	'17	289,452	*165,299	124,153	92,764	31,389
12 " "	'16	268,463	*149,405	119,058	87,139	31,919
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.						
1m., Mar.,	'17	$474,478	*$262,377	$212,101	$184,024	$28,077
1 " "	'16	450,803	*254,205	196,598	182,064	14,534
12 " "	'17	5,592,604	*3,038,892	2,553,712	2,180,643	373,069
12 " "	'16	5,453,357	*3,063,650	2,389,707	2,204,581	185,126

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*Includes taxes. †Deficit.

Traffic and Transportation

Seattle Limits Use of One-Man Cars

City Council Moves to Prevent Their More General Operation as Recently Authorized by the Washington Commission

The City Council of Seattle has adopted a resolution denying the right of the Puget Sound Traction, Light & Power Company to operate one-man cars, except as now authorized by the Council, and has served notice on the company that such cars will not be allowed to operate. It declares that the Public Service Commission, in authorizing the company to employ one-man cars on its lines in Seattle, reversed its opinion in the recent case of the Tacoma Railway, Light & Power Company. The resolution states that the action of the commission was unwarranted, because the case was an *ex parte* affair in which the city was interested, but had not been advised.

The Public Service Commission issued its order on April 26, so that the company could place orders for the cars and for material for conversion of single-truck cars into cars of the one-man type before the prices for material advanced, which was announced for May 1. The resolution, which was originally intended to be a mere protest against the action of the commission, was unanimously passed by the Council with a provision directing the corporation counsel to prevent the operation of one-man cars, and the Mayor said he would arrest the car men provided it was the proper method to pursue.

A paragraph in the resolution, which was adopted unanimously by the eight members present, provided that a copy of the resolution be forwarded to the company, notifying it not to purchase any cars, or to take any steps whatever to install one-man cars upon its system "until it shall have first obtained the consent of the city legislative act." The company was further notified that the city would resist by legal proceedings the violation of its franchise obligations "except as it has been relieved therefrom by or with the consent of the city of Seattle."

HOW THE SITUATION DEVELOPED

Nearly two months ago the traction company asked for the privilege of operating twenty-five one-man cars to furnish additional service on congested lines. The matter was referred to the franchise committee, before which officers of the company appeared and urged immediate action, so that an order might be placed before a proposed 25 per cent increase in prices materialized. The franchise committee, including Councilmen Oliver T. Erickson and W. D. Lane, and numbering five of the nine members of the Council, agreed to pass a bill granting the desired privilege at a meeting to be held on a Monday following, provided no patrons actually protested in the meantime. There were no protests, but instead of passing the bill, Councilman Erickson introduced a resolution denying the use of the small cars until such time as the company would allow the operation of city cars over its Third Avenue tracks and around the Jackson Street loop. The company then appealed to the commission.

The present resolution opposing the commission's order adds difficulties to a complicated situation. In accordance with a city ordinance, Corporation Counsel Caldwell brought suit some time ago to compel the company to pave between its tracks. This action was tried before Judge Kenneth Mackintosh on March 26 and the court has since held the case under advisement. The corporation counsel will immediately renew the motion of the city for dismissal of the company's application before the Public Service Commission to be released of certain franchise obligations. The commission will be asked to make an order similar to that which was issued in the Tacoma case, wherein it disclaimed jurisdiction to unburden a public utility of such obligations.

Free-Ride Order Opposed

Public Service Commission of Indiana Orders Free Transportation for Policemen and Firemen—Suit Brought in Federal Court

An application was filed on May 16 in the Federal Court at Indianapolis by the Indianapolis Traction & Terminal Company for an injunction to prevent the Public Service Commission of Indiana from enforcing a recent order which provides for the free transportation of firemen and policemen on the street railway systems of the State. Hearings were held by the commission early in May, following which an order was issued to the traction companies requiring them to carry city firemen and policemen on their cars without payment of fare in accordance with an act passed during the 1917 session of the Indiana Legislature, which amended a section of the utilities commission act. The traction companies contended at the hearing that the amendatory act is unconstitutional. The Indianapolis Traction & Terminal Company has asked a statement of the United States Court declaring the Public Service Commission's order void, that the commission be enjoined from enforcing the order and also from instituting any action, civil or criminal, for penalties for violating it, and finally, that all firemen and policemen, having notice of the suit, be denied free car rides when on duty.

The company claims that the commission, unless enjoined, "will subject the company to a multiplicity of actions, demands and penalties, which might amount to thousands of dollars." It is also charged that the commission's order is indefinite and incapable of enforcement and is, therefore, invalid, for "there is no means to ascertain when a policeman or fireman is on duty." Errors in determining the status of the firemen or policemen might also cause large penalties. It is further contended that these penalties and the intention of the commission to enforce the free-ride order will intimidate the company's employees in the discharge of their duties, encourage firemen and policemen to resist the payment of fare, cause disturbance on the cars which would discourage the public patronage.

Robert I. Todd, president and general manager of the company, stated in his affidavit that E. I. Lewis, chairman of the Public Service Commission, had advised him that the commission would give the company until Monday, May 14, to comply with the order, which was passed on May 8.

Transfer Areas Suggested

A Day's Transfers Wheeled Into Directors' Meeting to Impress the Board

At a hearing on May 18 before the ways and means committee of the Massachusetts Legislature, on the bill to relieve the financial necessities of the Boston Elevated Railway, President M. C. Brush urged that the provision which authorized the company to acquire property for inclosed transfer areas be restored to the bill. Mr. Brush reviewed the abuses of the transfer privilege in Boston, pointing out that at Central Square, Cambridge, the company is now losing $60,000 a year through the lack of an inclosed transfer area. He said that 80 per cent of the paper transfers now in use at Boston could be eliminated by the establishment of inclosed transfer areas, and that in order to impress the directors of the company with the volume of transfers issued he had recently wheeled one day's transfers in a barrow into the meeting of the board. Speaking of the abuses possible at Boston, Mr. Brush said that he recently gave a conductor a nickel and asked him to ride as far as possible on the system without paying a second fare, with the result that the employee covered more than 50 miles. Local merchants object to the establishment of transfer areas on account of its effect on their patronage.

F. E. Snow, counsel for the company, said that the purchase of the Cambridge subway by the State, and other relief measures suggested in the bill, would provide the company with capital temporarily, but that it would not yield the necessary revenue. He said that a 6-cent fare is the only ultimate solution of the company's problem.

Bonding Company for Washington Jitneys

State Insurance Commissioner H. O. Fishback, Olympia, Wash., upon receipt of an opinion from Attorney General Tanner, has announced that the Mutual Union Insurance Company, organized by jitney drivers of the State to write bonds for jitney operators, may write such bonds, provided it complies with all of the laws covering the writing of this class of business. Commissioner Fishback has announced also that the company will be required to have assets to the amount of $300,000 before bonds can be written. This decision has resulted in the issuance of a restraining order by Superior Judge Smith which forbids Prosecuting Attorney Lundin from interfering with the operation of jitney buses under the bonds written by the Mutual Union Insurance Company until a hearing is held on petitions now pending for a permanent injunction. It is probable that the jitney drivers will apply for a writ of mandamus to compel the Secretary of State and the Insurance Commission to issue a license to the company, and in the meantime will ask an injunction to prevent prosecution because they are without bonds.

W. R. Crawford, president of the mutual company, urges that the mutual insurance company statutory provision, which provides for the acceptance of contingent assets of members, be applied in rating the jitney surety company, but this Commissioner Fishback declines to do. Mr. Crawford holds that the contingent liability provision, by which each member is liable for the sum of six times his premium, is mandatory upon the commissioner in the jitney application. Under this provision, the 321 members, each paying $200 premium annually, acquire a total asset which the mutual company's representative argues is complete compliance with the law. Commissioner Fishback says he will not take this view of the case unless ordered to do so by the court.

The jitney men's case is further complicated by the fact that the receiver of the defunct Casualty Company of America, the New York firm which has heretofore written all jitney bonds in the State of Washington, has notified Secretary of State I. M. Howell that all bonds became void on May 4. Commissioner Fishback is now seeking a ruling from Attorney General Tanner as to whether the company can void the jitney bonds without refunding the unearned portion of the paid premiums.

I. C. C. Dismisses Transfer Case

The complaint filed with the Interstate Commerce Commission by C. Elton James and other residents of communities in Virginia served by the Washington & Old Dominion Railway, Washington, D. C., charging that the withdrawal of the transfer arrangement existing between that company and the Capital Traction Company subjected them to unjust and discriminatory fares was dismissed on May 5. The complaint was filed with the commission on Aug. 12, 1916.

There is no connection between the two lines, but their terminals at Thirty-sixth and M Streets in Washington are within a few feet of each other. Prior to Aug. 9, 1916, transfers from the Capital Traction Company were good on the Great Falls division of the Washington & Old Dominion Railway to Cherrydale, and on the Bluemont division to Thrifton. After that date through commutation fares to Washington were published by the Washington & Old Dominion Railway from points on both its Bluemont and Great Falls divisions. This change resulted in an increase in the total charges paid by commuters whose business brings them into the city.

The commission held that the Capital Traction Company is not subject to its jurisdiction and, therefore, it has no power to require the restoration of the transfer arrangement previously existing between the two companies. The case was ordered held open for fifteen days to give the complainants opportunity to file a request for a further hearing on the question of rates on the Washington & Old Dominion line. The rates in the present case on this line were not questioned.

Pacific Electric Men Send Out Letter

Supplementing the work of the Pacific Electric Railway employees of Los Angeles, Cal., in securing signatures on a petition for an initiative ordinance intended to bring the jitneys under more rigid control, an open letter of appeal has been sent out to the people of the city. This movement was begun by the Los Angeles Railway men some time ago in the hope of helping the company to restore its revenues and enable it to increase wages. It has been reviewed previously in the ELECTRIC RAILWAY JOURNAL. The letter read in part as follows:

"Our future and the future of our families are at stake. There are now more than 400 jitneys operating in Los Angeles County. We should be placed on a fair competitive basis with them. The jitney bus should be forced to bear the same burdens that railway service bears; forced to accept responsibility for accidents; forced to pay the same proportion of street paving; maintain service whether it pays or not; give and take transfers; operate in poorly paying territory as well as on the paying streets; give up nickel-sniping from our cars and go into the service of the public on a business basis."

Inter-Company Service Authorized

Through service over the Bay State Street Railway, Boston, Mass., and the Boston Elevated Railway between Winchester and Harvard Square, Cambridge, will soon be established as the result of an order of May 18 by the Public Service Commission. By an act of 1916 the commission was authorized to grant track locations for the establishment of through service by two or more companies in cases where the municipality has refused such location rights. In the present case the board overruled the town of Arlington and ordered a single-track connection between the two systems where the lines are to be joined. The board held that the establishment of through service would not add sufficiently to the traffic congestion on the Boston Elevated lines feeding the Cambridge subway to warrant a refusal of the Winchester petition.

Street Semaphores for Seattle.—Upon the recommendation of Superintendent of Utilities A. L. Valentine, Seattle, the City Council recently authorized the installation of semaphores at several congested street intersections. Semaphores of two different types have been installed.

Trolley Wreck Near Cleveland.—A car of the Cleveland & Eastern Traction Company, which was filled with passengers and stalled at a switch, was sideswiped on May 20 by a car going in the opposite direction. The concussion was such that the standing car tipped over on its side, injuring ten persons, one of them seriously.

More Skip Stops Before Detroit Council.—Agitation for a trial of skip-stop service on the Hamilton and Grand River lines of the Detroit (Mich.) United Railway has resulted in the introduction of resolutions in the Common Council which place the question before the Aldermen for consideration. This form of service has proved very popular on the Woodward and Jefferson lines, and the company is ready to extend its application as soon as it receives permission from the city.

City Fails to Reduce Fares.—The lack of proper procedure in advertising an ordinance seeking to reduce street car fares in Newport, Ky., to 3 cents has invalidated the measure, according to a recent decision of the Kentucky Court of Appeals, sitting at Frankfort. The ordinance would have compelled the South Covington & Cincinnati Street Railway to charge a 3-cent fare inside the city of Newport and 5-cent fares to all points on the line outside the city, with universal transfer privileges. The court sustained the finding as rendered by the Campbell Circuit Court.

Novel Anti-Parking Signs in Louisville.—Managements of office buildings and large department stores in Louisville, Ky., are making use of curb signs with the inscription: "Please Do Not Park Cars Here," written in white letters on a black field. The signs are placed at the entrances to the buildings and prove effective in keeping the street clear at those points. They are made from 6-in. x 6-in. timbers about 5 ft. long, which are sawed lengthwise to give an approximate triangular section. The inscription is placed on the sloping surface so as to be easily seen from vehicles.

Utica Fare Increase Contested.—The tariff of the New York State Railways, Utica Lines, which was filed with the Public Service Commission for the Second District, increasing by 5 cents the round-trip fares from Utica to Rome, Frankfort, Ilion, Mohawk, Herkimer and Little Falls became effective on May 15. The Mayor of Little Falls and other residents made complaint against these increases, but the complaint was not received until after the new tariffs became effective. The complaint is accordingly being served on the company as a complaint against existing fares, to which the company has twenty days to make a reply.

Albany Fare Case Settled.—In the matter of a change of fares on the lines from Albany to Troy of the United Traction Company, Albany, N. Y., which was one issue of a general controversy in that city recently the company has withdrawn its proposition. A half-hourly service is now furnished on the Albany-Troy steam belt line for a 15-cent fare, while the electric railway rate between the two cities is 10 cents, with no transfers at either end. The attempt was originally to compel a reduction in fare through a bill introduced in the Legislature, which stipulated a 10-cent fare on this line, with transfer privileges.

Costs Will Affect Fares in Detroit.—The Detroit (Mich.) United Railway, through the columns of a recent issue of its weekly publication, *Electric Railway Service*, has explained to its patrons, in a simple and straightforward manner, what the prevailing high prices mean to the electric railway industry, and that if costs continue to rise fares on that road must be expected to advance. The company estimates that an additional expenditure of $600,000 will be required this year to meet the increased cost of coal. It is pointed out that in the case of other public utilities, and also private enterprises, selling prices are regulated to suit varying costs, which is not readily done by railways.

Twin Cities Service Portrayed in Folder.—A well-illustrated booklet entitled "The Twin Cities To-day" has just been issued by the Twin City Rapid Transit Company, of which A. W. Warnock is general passenger agent. The booklet is intended to convey a cordial invitation to strangers to visit the many enjoyable places of interest in Minneapolis and St. Paul, which are sometimes characterized by the phrase "the cities of lakes, rivers and parks." It contains, besides illustrations and statistical data, colored maps of the two cities, the University of Minnesota grounds and some of the more important parks, showing the connection of trolley lines, and gives information concerning car schedules.

Electric Railway Accident Statistics.—The accident bulletin issued by the Interstate Commerce Commission for the quarter ended Sept. 30, 1916, summarizes the accidents of various kinds which occurred on electric railways during that period. According to the report there were sixty-one train accidents which resulted in the death of four persons and the injury of 210. The number of deaths resulting from ordinary train-service accidents was 153, seventy-three of which involved grade-crossing accidents; the number of injuries was 714, of which 268 were received in getting on or off cars, while 187 of these involved grade-crossing accidents. To these figures are added the number of non-train casualties, making the total number of deaths 180 and the number of accidents 1326.

Suit Brought in Duluth Fare Case.—James E. Gardner, Jr., has brought suit against the Duluth (Minn.) Street Railway in the district court of that city in an effort to test the right of that company to charge a double fare on one of its lines. This situation was reviewed in the ELECTRIC RAILWAY JOURNAL for May 5, page 848. The Public Affairs Committee granted the company permission to charge a 10-cent fare on its Morgan Park line in order that the company might get funds for extending the line to New Duluth. Many of the patrons have opposed the measure, but the city attorney pointed out that in his opinion the city could not prevent it. To make an issue, Gardner refused to pay the double fare and was put off the car, for which he is suing the company for $500 damages.

Universal Transfer System for Cincinnati.—Mayor Puchta has approved the new universal transfer schedule for Cincinnati and it is now in effect. It provides for transportation between two points by the most direct route at a fare of 5 cents, as provided in the loop lease and revision ordinance recently approved. The principal features of the system are the triple transfer provision for East End patrons, enabling them to go to Norwood or Avondale without going down town, double transfers on crosstown lines, double transfers for College Hill residents on Winton Place lines to Avondale and Winton Place, and a 5-cent fare on the Millcreek Valley line within the city limits. Each conductor has been provided with a book of 124 pages showing the transfer privileges on every line in the city.

State Commissions Order Safety Measures.—In connection with the Public Service Commission of the First District of New York, the up-State Public Service Commission at Albany has announced an order requiring the Long Island Railroad, New York, N. Y., to maintain a guard between each two passenger cars of its multiple-unit trains, to equip all such cars with vestibule gates or doors and trapdoors, which must be kept closed except when stopping at stations, and to keep trapdoors closed except when the train is proceeding between consecutive stations at which the station platforms are substantially on a level with the rails. This decision was reached after a long investigation by both commissions and after a full hearing and rehearing of the case. The commissions announced that it was necessary in order to make travel safe in the crowded commuting district involved.

Military Work Swells Traffic.—The amount of business handled by the Louisville & Southern Indiana Traction Company, New Albany, Ind., has increased as a result of the present military activities. The quartermasters' depot at Jeffersonville, Ind., is one of the important supply depots for the entire army, and a tremendous volume of business is being handled there. One of the big branches of this depot is the sewing department, which issues large quantities of material out of which the clothing for the soldiers is made. Thousands of women from across the Ohio River, who are constantly engaged on this work, reach the depot via the cross-river line to Louisville, the line to New Albany and the Jeffersonville city line. In addition there is a large amount of freight being handled, most of it by steam cars, since the government takes possession of these cars at will. Electric cars are loaded at the depot when the wagons of the company in Jeffersonville are not sufficient in number to make the collections.

Three Auto-Bus Lines for Rome.—The Public Service Commission for the Second District of New York has granted certificates of convenience and necessity for three motor-bus lines running into Rome. The Rome & Boonville Auto Bus Company, Inc., is permitted to operate through Dominick Street, North James Street, North George Street and Turin Street. A certificate is granted to the Rome & Northern Auto Bus Company to operate along North James Street and upon other streets in Rome for the purpose of delivering and picking up passengers and parcels. These lines are parts of a line to Boonville. The minimum fare is to be 15 cents, and no local passengers are to be carried within the city of Rome. J. Franklin Hyde has also received permission to operate a line from Rome to Oneida and Sylvan Beach. These buses will carry passengers and will carry freight in trailers, provided such a practice is not deemed dangerous. The route will run from James and Dominick Streets in Rome to the Oswego Road and into the town of Verona; also along South James Street to where the Rome and Verona roads intersect. In Oneida the buses will travel the usual route through that city to the bridge on Scononda Street, over the Oneida Creek. The applicant agrees to file with the commission any proposed changes in freight and passenger rates.

Personal Mention

C. W. Bridges is now traffic agent of the Pittsburg County Railway, McAlester, Okla., having succeeded F. M. Essig.

Thomas B. Willard, assistant treasurer of the Tidewater Power Company, Wilmington, N. C., has been made assistant secretary-treasurer.

Fred E. Sterling has been appointed a member of the State Public Utilities Commission of Illinois by Governor Lowden, effective on July 1.

H. A. Bullock, secretary of the New York Municipal Railway Corporation, Brooklyn, N. Y., began service in the training camp at Plattsburg on May 22.

Harry Woollcott, secretary and purchasing agent of the Tidewater Power Company, Wilmington, N. C., has been elected treasurer of the company to succeed the late R. J. Jones.

Walter H. Taylor has resigned as solicitor at Norfolk for the Virginia Railway & Power Company on account of the pressure of other business. The duties of the office will be discharged by W. H. Venable, general attorney of that city.

Edward Dana, manager of surface transportation of the Boston (Mass.) Elevated Railway, recently gave an illustrated lecture before senior students of electrical engineering at the Massachusetts Institute of Technology on the subject of traffic studies and their importance in the fixing of schedules.

Arthur W. Brady, president of the Union Traction Company of Indiana, Anderson, Ind., on May 17 was appointed by Governor Goodrich a member of the State Council of Defense. The State Council is organized to co-operate with the Council of National Defense and will take charge of the organization and direction of all the resources of the State.

Charles G. Miller has resigned as assistant secretary of the Cincinnati (Ohio) Traction Company to accept the position of business manager of the Cincinnati Zoological Park Association. Mr. Miller had been in temporary charge of the Zoo for about six months. He began his services with the local traction company in Cincinnati about ten years ago. He served successively as secretary and chief clerk to Vice-President Draper before becoming assistant secretary of the company.

C. E. Fasoldt has been appointed engineer of power and lines for the United Traction Company, Albany, N. Y., to succeed H. J. Childs, who is now electrical engineer for the Chateaugay Ore & Iron Company, Lyon Mountain, N. Y. Mr. Fasoldt has been in the employ of the General Electric Company, Schenectady, N. Y., since 1902. He spent about two and a half years in the testing department and has since been engaged in power-plant construction and in the office of the construction department.

A. H. Towne, who has been engineer of maintenance of way for the Berkshire Street Railway, Pittsfield, Mass., since 1914, has resigned. He will return to Springfield to resume work with the engineering firm of Durkee, Towne & White, of which he is a member. Mr. Towne entered the employ of the Berkshire Street Railway in 1901. He had charge of the construction of the company's line from Bennington, Vt., to Canaan, Conn., the extension from Great Barrington to Egremont, and also its Lee-Huntington line. No successor to Mr. Towne has yet been appointed.

George Gibbs, of the firm of Gibbs & Hill, consulting engineers, New York City, has sailed for Russia, together with five other representative railway men of this country, forming the advisory commission of American railway experts whose services are to be placed at the disposal of the Russian government. The commission, which is headed by John F. Stevens as chairman, is to act in a consulting capacity with the aim of improving the chaotic conditions existing to-day in the transportation industry in Russia. It is to lend its aid in the construction of new lines and the rehabilitation of existing railroads and their equipment, and in addition will consider the immediate problems of operation which have been such a serious handicap to Russia since the war began.

Ellsworth L. Mills, who has been chief of the track division of the Public Service Commission of the First District of New York, has resigned from the firm of Gibbs & Hill, consulting engineers to the commission, to become associated with the firm of Dilworth, Lockwood & Company, steel merchants, New York. During his connection with the commission Mr. Mills was in charge of the design and the preparation of the contracts for the track work for the city-owned lines of the dual system. Before becoming associated with Messrs. Gibbs & Hill, Mr. Mills was engaged on the Grand Central Terminal improvements of the New York Central Railroad. The supervision of track design and of all contracts for the purchase of materials has been assumed by Robert H. Jacobs, division engineer.

James Harmon, who was safety agent for the Middle West Utilities Company with headquarters at Indianapolis, has been transferred to Chicago as claim adjuster of the bureau of safety of the same interests. Mr. Harmon has been engaged in accident prevention work for several years. He received his first experience with railway operation while working as a conductor. He was one of the first to recommend street car cards to designate the proper methods of boarding and leaving cars. About 1910 Mr. Harmon became claim and safety agent for the United Gas & Electric Company and later of all the Samuel Insull properties in New Albany and Jeffersonville, Ind., and in Louisville, Ky. During that time he introduced periodical examinations for trainmen and other employees and gave other instruction in safety methods. In October, 1914, he was made safety agent for all the Insull properties in Indiana with headquarters at Indianapolis, and was succeeded in that position a few weeks ago by Frank H. Warren of the Union Traction Company of Indiana.

BRUCE CAMERON

Bruce Cameron, superintendent of transportation of the United Railways, St. Louis, Mo., was elected president of the Missouri Association of Public Utilities at its 1917 annual convention. Mr. Cameron was born on a farm in Vernon County, Mo., in 1877. After he had completed the Nevada High School course he studied at Missouri University and later attended Fort Worth College at Fort Worth, Tex. His first connection with the United Railways was formed in 1898, when he entered the engineering department after a venture in the asphalt business at Dougherty, I. T. He was later assigned to work in the operating department of which he has since been a vital factor continuously, with the exception of a few months in 1906 when he engaged in the lumber business in Helena, Ark. The following year he returned to St. Louis to become superintendent of transportation, his present position. Mr. Cameron has shown an active interest in the welfare work of the company.

Obituary

L. R. Pomeroy, consulting railway and electrical engineer, died at his home in Orange, N. J., at the age of sixty years. Mr. Pomeroy was graduated from Irving Institute, and had dealt with electric railway problems since that time. In 1902 he became connected with the General Electric Company and devoted most of his time to the study of railway electrification for several years. He also spent two years in the employ of the Safety Car Heating & Lighting Company, and in 1910 became engineer of the railway and industrial division of J. G. White & Company. A year later he entered consulting engineering work in New York City.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Eastern Transit Line, Inc., Weehawken, N. J.**—Incorporated to construct and operate a general passenger and freight line in New Jersey. Capital stock, $350,000. L. H. Smith, 911 Boulevard, Weehawken, vice-president.

Syracuse & Northern Electric Railway, Syracuse, N. Y.—Incorporated to take over the Syracuse & South Bay Railway and the Syracuse, Watertown & St. Lawrence Railway. Capital stock, $1,243,750. Incorporators: C. Loomis Allen, Talmadge C. Cherry and Alexander H. Cowle.

FRANCHISES

Wilmington, Del.—DeArmond Lindes, Philadelphia, has asked the Levy Court for a franchise to construct an electric railway beginning just outside the limits of the city of Wilmington, extending south along the county road through Farnhurst to Hare's Corner, State Road, Bear Station, Red Lion, Corbit, St. Georges, Macdonough, Odessa, Middletown, Townsend, Blackbird and Smyrna. Mr. Lindes' petition stated that he is about to organize a corporation under the laws of Delaware for the purpose of building the road, which will carry both passengers and freight.

Springfield, Ill.—The Chicago, Springfield & Cairo Railway has asked the Public Utilities Commission of Illinois for a certificate of convenience and necessity authorizing it to construct and operate a line from Springfield to Cairo, via Pawnee, Hillsboro, Greenville, Nashville, Pinckneyville, Murphysboro and Jonesboro. J. B. Campbell, president, and A. E. Taylor, secretary. [July 22, '16.]

Waterloo, Iowa.—The City Council recently passed an ordinance granting a new franchise to the Waterloo, Cedar Falls & Northern Railway in Waterloo. The franchise provides definite terms and conditions under which the company may occupy the streets and for the admission into the city of other interurban railways over the tracks of the Waterloo, Cedar Falls & Northern Railway. The franchise will be presented to the people for approval at a special election to be held June 11.

St. Clair Heights, Mich.—The Detroit United Railway has asked the City Council of St. Clair Heights for a thirty-year franchise to construct an extension on Harper Avenue from Gratiot to Montclair Avenue, thence on Montclair to Shoemaker Avenue to St. Jean Avenue, south on St. Jean Avenue to the city limits.

Kansas City, Mo.—The Kansas City Railways has received a franchise from the City Council to double-track its line on Thirty-ninth Street from Summit Street to Main Street.

Brooklyn, N. Y.—The application of the Brooklyn Rapid Transit Company for a franchise to construct an extension on Eighty-sixth Street from Fifth to Third Avenue has been referred by the Board of Estimate to its committee on franchises. One of the ideas in the extension is to accommodate patrons of the surface cars in making connections with the Fourth Avenue subway.

New Rochelle, N. Y.—The Westchester Electric Railroad has received permission from the Public Service Commission for the Second District of New York to build a second track on Main Street, New Rochelle, from Rose Street to near Harrison Street; a double-track curve from Main Street into Franklin Avenue, with curves into Rose Street and an extension of its single-track line in Winyah Avenue from North Avenue to the west city line. Local franchises for both the extensions have been approved by the commission.

Cincinnati, Ohio.—The Cincinnati, Lawrenceburg & Aurora Electric Street Railroad has asked the City Council for a renewal of its existing franchise for a period of twenty-five years. While the present franchise has eight years to run, the renewal for the twenty-five-year period is desired to conform with other franchises along the route, and for the purpose of bringing about legislation providing for rapid transit service for the western part of the city. The company also desires to relocate its present track on Lower River Road within the former villages of Delhi, Sayler Park and Fernbank on private right-of-way and on Commercial Avenue.

Pennsburg, Pa.—The City Councils of Pennsburg, East Greenville and Red Hill have passed ordinances granting the Montgomery Transit Company the right-of-way for its proposed trolley line from Norristown to Allentown. Work has been begun at Lederachville.

Milwaukee, Wis.—A franchise has been passed by the City Council of Milwaukee for the construction of an extension by the Milwaukee Electric Railway & Light Company on Mitchell Street to Muskego Avenue, on Muskego Avenue to Burnham Street and on Burnham Street to Twenty-sixth Avenue.

TRACK AND ROADWAY

***Lakeport, Cal.**—G. L. Hardison, Rialto Building, San Francisco, is reported interested in a project to construct a line from a point near Hopland to Lakeport, about 24 miles.

Georgia Railway & Power Company, Atlanta, Ga.—A contract has been entered into whereby the Georgia Railway & Power Company will furnish the electric energy for Cartersville for all private and public light and power purposes.

Chicago, Fox Lake & Northern Electric Railway, Chicago, Ill.—This company is now ready to begin construction work on its proposed line from Evanston to Palatine, via Niles Center, Niles, Park Ridge, Desplaines, Mount Prospect and Arlington Heights. It is reported the company will take over the Palatine, Lake Zurich & Wauconda Railroad, which operates a steam line from Palatine to Wauconda. From Wauconda the new line will extend north to Volo, Fox Lake, Lake Geneva, Antioch, then west and north to Elkhorn and Jefferson, Wis. L. K. Sherman, Chicago, chief engineer. [March 24, '17.]

Chicago & Interurban Traction Company, Chicago, Ill.—This company reports that it is rehabilitating its double-track lines on Western Avenue and Burr Oak Avenue in Blue Island. Trolley guards will be installed at all railroad crossings this summer.

Louisville & Southern Indiana Traction Company, New Albany, Ind.—This company has completed repairs to its State and Vincennes Street lines, damaged by the tornado in March. The repairs involved the purchase of new poles and about 2 miles of new trolley cable.

Fort Dodge, Des Moines & Southern Railway, Boone, Iowa.—It is reported that the Fort Dodge, Des Moines & Southern Railway will expend $250,000 in extensions and improvements.

Tri-City Railway, Davenport, Iowa.—Work will soon be begun by the Tri-City Railway on the reconstruction of its tracks on Rock Island arsenal island from Fort Armstrong Avenue to the arsenal shops. It is estimated that the work will cost about $60,000.

Union Traction Company, Coffeyville, Kan.—A committee of Claremore business men has been appointed to confer with officials of the Union Traction Company with a view to the extension of that company's line from Nowata to Claremore, thence to Tulsa via Collinsville.

Boston (Mass.) Elevated Railway.—The legislative committee on metropolitan affairs on May 21 voted to report favorably the bill providing for the extension of the Malden subway to Everett. The act is made contingent upon acceptance by the municipal government of the two cities and also acceptance by the directors of the Boston Elevated Railway.

Michigan Railway, Kalamazoo, Mich.—Chief Construction Engineer Watkins of the Michigan Railway has stated that it is possible that the route of the proposed line from Owosso to Flint will be changed. The possibility of expensive litigation to get the right-of-way is responsible for the company looking for another route.

***Lansing, Mich.**—It is reported that an electric railway may be constructed from Lansing to Mount Pleasant, via Alma. Marcus Polasky, Alma, is interested.

Southwest Missouri Railroad, Webb City, Mo.—This company plans to extend its line from Baxter Springs, Kan., to Pilcher, 7 miles. This will be a continuation of its extension from Galena to Baxter Springs.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—This company will improve the roadway between its rails in the boroughs of Pennington and Hopewell.

International Railway, Buffalo, N. Y.—Work will be begun at once by the International Railway on the construction of an extension of its Delavan Avenue line to Ridge Road and along the Ridge Road to Schiller Road.

East Liverpool Traction & Light Company, East Liverpool, Ohio.—Work has been begun by the East Liverpool Traction & Light Company repairing the Chester-East Liverpool bridge. A number of other repairs to the tracks in East Liverpool are also under way or will be begun in the near future.

Mansfield Public Service & Utility Company, Mansfield, Ohio.—This company is erecting a new bridge over the Pennsylvania Railroad lines at Spring Mills.

Ohio Electric Railway, Springfield, Ohio.—Work has been begun by the Ohio Electric Railway rebuilding the temporary bridge across the Miami River south of Middletown. A portion of the bridge, 300 ft. in length, was torn away during the high water of early March.

Sand Springs (Okla.) Railway.—It is reported that the Sand Springs Railway is considering the use of the surface contact system for the operation of its line between Tulsa and Sand Springs in place of the overhead system now being used.

St. Thomas (Ont.) Municipal Railway.—The City Council of St. Thomas has under consideration the construction of an extension of the St. Thomas Municipal Railway to Pinafore Park. A trestle to cost $8,000 will be erected at Elm Street hill.

Beaver Valley Traction Company, New Brighton, Pa.—A new signal system has been installed by the Beaver Valley Traction Company along its single-track line in Bridgewater.

Stroudsburg (Pa.) Passenger Railway.—Work will be begun at once by the Stroudsburg Passenger Railway reconstructing its track along Washington Street between the State bridge and Crystal Street.

Bristol (Tenn.) Traction Company.—According to a resolution recently passed by the City Commissioners of Bristol, the Bristol Traction Company will be asked to remove all the poles, track, ties and trolley owned by the company on West State Street west of Little Creek in Bristol.

Yakima Valley Transportation Company, North Yakima, Wash.—This company plans the construction of a 3-mile extension to its Selah branch, and a 1-mile extension in the Wide Hollow-Summit View district west of the city. Both extensions will enter heavy fruit districts.

Tacoma Railway & Power Company, Tacoma, Wash.—This company's plan of co-operation with the city of Tacoma in establishing and operating the municipal street car line to the Todd shipyards on the tideflats was recently accepted by the City Council and signed by the Mayor. The question of operating the line is left open to final settlement, but it is probable the city will operate the line. No mention is made of a transfer agreement. The Tacoma Railway & Power Company gives up its franchise to operate the present Eleventh Street line, municipally-owned, to take effect when the proposed extension to the Todd plant is completed.

SHOPS AND BUILDINGS

Chicago & Interurban Traction Company, Chicago, Ill.—This company reports that it has just completed and is now using its new terminal tracks and building in Kankakee.

Evansville (Ind.) Railways.—The city of Evansville will construct a station at Howell, a suburb, to be used by the Evansville Railways and the Louisville & Nashville Railroad. The structure will cost about $60,000.

Worcester (Mass.) Consolidated Street Railway.—Bids have been asked by the Worcester Consolidated Street Railway for the construction of two trolley freight terminals at Shrewsbury and Albany Streets, near Boulevard Park, one to be used by the Boston & Worcester Street Railway and the other by the Worcester Consolidated Street Railway. The stations will be 280 ft. long and 30 ft. wide, of mill construction on concrete foundations and provided with loading platforms. One will have a second story at one end to provide offices for the freight department clerical force. The contemplated cost of construction is about $75,000.

Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont.—Fire recently damaged the carhouse and power plant of the Windsor, Essex & Lake Shore Rapid Railway to the extent of about $150,000.

Jefferson County Traction Company, Beaumont, Tex.—Work will be begun at once by this company on the construction of a new interurban station on Waco Avenue between Proctor and Fifth Streets. Two buildings will be constructed, one to be used for the interurban station and the other for the interurban express station. The buildings will be one story high and will be constructed of hollow tile and will have a stucco finish. It is estimated that the completed station will cost approximately $20,000.

POWER HOUSES AND SUBSTATIONS

Pacific Electric Railway, Los Angeles, Cal.—Work will soon be begun by the Pacific Electric Railway on the construction of a mechanical plant in San Bernardino to handle all repairs for the company on the eastern division, or all the lines in southern California east of Upland. The cost is estimated at about $50,000.

Chicago & Interurban Traction Company, Chicago, Ill.—This company reports that it is installing automatic control of the 500-kw. rotary in its substation at Monee and is equipping one 300-kw. portable rotary for use where service may require.

Galesburg Railway, Lighting & Power Company, Galesburg, Ill.—This company contemplates improvements to its power plant.

Springfield (Mass.) Street Railway.—A new substation will be erected by the Springfield Street Railway at 101 Margaret Street to cost about $30,000.

Delta Light & Traction Company, Greenville, Miss.—This company reports that it has purchased one GE 1000-kw., 2300-volt, 60-cycle, three-phase high-pressure turbine and one barometric condenser from the Ingersoll-Rand Company, delivery to be made on Jan. 1, 1918.

Poughkeepsie & Wappingers Falls Electric Railway, Poughkeepsie, N. Y.—Improvements in its power plant are being contemplated by this company.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—This company is constructing a new transmission line from Lowellville to Masury. Work has been begun on the construction of a large outdoor substation at Masury, at which the transmission line will terminate. The company has practically completed the remodeling of its Sharon substation, which has been made fireproof throughout. Much new apparatus has been installed and other equipment is expected shortly.

Charleston Consolidated Railway & Light Company, Charleston, S. C.—A transformer station will be erected by the Charleston Consolidated Railway & Light Company costing about $5,000.

South Carolina Light, Power & Railways Company, Spartanburg, S. C.—This company contemplates a number of extensions to its transmission lines.

Roanoke Railway & Electric Company, Roanoke, Va.—This company is rehabilitating its Walnut Avenue power plant and increasing its capacity from 6000 hp. to 19,075 hp., at a cost of approximately $300,000.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company will construct a frame substation building at First Avenue South and Spokane Street, having a motor generator with 500-kw. capacity, to be increased later to 1000 kw. The building and equipment will cost $12,000.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Gear Deliveries Set at Three to Four Months

Delivery Is Dependent on the Receipt of Blanks—Standardization Hardly Possible

During the past year, as a result of the shortage in gears, there have been several long delays in the assembling of equipment under new cars. Therefore the present status in the gear delivery situation should command attention. This paper was recently requested by the purchasing department of a large railway company to present in the "Manufactures and Markets" department a summary of the delivery conditions for railway motor gears as given by the various prominent manufacturers of this very important part of car propulsion equipment.

FOUR MONTHS DELIVERY

According to the largest producers of railway gears, the delivery on treated gears may be stated as three to four months. This is a close limit, however, and one manufacturer says: "We believe that no railroad is safe at the present time unless it has forecast its delivery needs by four to five months. We are strongly recommending that all purchases be made now for one year or more in advance with bona fide orders placed now and delivery spread out as the customer may require the material. This will enable us to lay in our raw materials at present prices and to protect the customers on the later deliveries."

All manufacturers, of course, when a real emergency arises, will exert every effort to anticipate gear deliveries under the three or four months' limit stated above. It is understood that it is the regularly quoted delivery.

One large manufacturer is quoting treated pinions and untreated gears at ten weeks, and makes the following explanation: "These promises are based on gears and pinions which are standard with us and which are sizes that can be cut from our standard blanks. In cases where a customer demands special gears and pinions, the best shipment which we could offer is from six to seven months. The limiting feature on any special gear or pinion would be the securing of satisfactory blanks from the steel manufacturers." In this connection one manufacturer has stated that, due to the abnormal pressure put upon the steel plants, the standard of inspection has necessarily fallen with the demand for increased tonnage. This results in more rejections in the gear cutting plants, even after work has been started on the castings or blanks. It is understood that the gear cutters are endeavoring in every possible way to maintain their previous standards of inspection.

DELIVERIES ON PINIONS POOR

Another large manufacturer comments on deliveries as follows: "On certain types of railway gearing we may have a goodly quantity of castings or forgings in stock which could be turned out in a minimum time. In other cases where we are to order the castings or blanks the delivery would appear unreasonable. However, inasmuch as other gear manufacturers purchase from the same or similar sources of supply, their conditions would be the same, varying only with those cases where they may have a good stock of material on hand. Of course the gear situation is worse than on pinions because so many different types must be kept in stock to cover all requirements. We aim to keep on hand enough castings and forgings to supply rush requirements on those types of motors where the demand is great, in both treated and untreated grades.

"In the case of cast steel gears it requires approximately eight weeks to get castings, while on forged steel the conditions are much worse, the promises now being given by the steel companies at six to eight months. This covers both treated and untreated gearing. In the case of pinions, where a small shipment is required to keep a car running, we can fill a small order in ten days to two weeks and large quantities in correspondingly good time. This is based upon the assumption that we will have the forgings in stock, which we have for all ordinary sizes. While it is not quite so difficult to obtain pinion forgings as it is gear forgings, it is requiring approximately two months to make deliveries."

On the subject of greater standardization of railway motor gears, the manufacturers are a unit in agreeing that more complete standardization would be of great benefit. It is the belief, however, that complete standardization is impossible without a sacrifice of the mechanical end, and one manufacturer states that this would more than offset the inconveniences to him in having to manufacture such a great number of non-standard gears.

Used Rails Bring Record Prices

Light Rails Sold Well Into 1918—Scarcity of Rerolling Rails Marked—Production in 1916 About 3,000,000 Tons

That the prices in the steel market are abnormal is apparent from the fact that old rails are actually worth as much or more than new tonnage, which brings $38 to $40 a ton, these being the prices of standard sections of Bessemer and of open-hearth rails, respectively. Scrap rails have been sold in Chicago for as high as $30 a ton and in Pittsburgh for practically the same amount. In Philadelphia they have brought in the neighborhood of $35 a ton. These old rails which are still in condition for use have been sought for eagerly by many purchasers who would be glad to get these rails rather than to wait for a year or more to secure tonnage already on order.

At the present time no large orders are being placed for standard sections, but orders for light rails are active from coal mining and lumber interests. The mills rolling light rails from billets are sold up for at least a year, and on this account numerous sales of light rails have been reported at about $5 a ton higher than recent prices. The scarcity of rerolling rails is more marked than usual because on this product the mills are sold up well into 1918.

At the present time about 60,000 tons of rails have been purchased in this country for delivery in 1919. Canada is in the market for rails, as nearly 600 miles of old rail has been torn up in the Dominion and shipped to France to be used in the construction of railroads that supply the troops at the front. It is evident that these rails must soon be replaced in Canada, or railroad facilities there will be crippled in many sections.

PRODUCTION OF STEEL RAILS BEST SINCE 1913

The total production of steel rails of all kinds in the United States in 1916 was 2,854,518 tons, as against 2,204,203 tons in 1915 and 1,945,095 tons in 1914, according to the figures compiled by the American Iron and Steel Institute. The record year was 1906, when 3,977,887 tons were produced.

The production of all kinds of rails in 1916, classified according to their weight per yard, was as follows:

Gross Tons	Under 50 Lb.	Under 85 Lb.	85 Lb. and Over	Total Gross Tons
Open-hearth steel rails..	134,594	313,840	1,821,166	2,269,600
Bessemer steel rails....	28,378	252,076	159,638	440,092
Other	132,563	875	11,388	144,826
Total	295,535	566,791	1,992,192	2,854,518

Of the 1916 output 2,269,600 tons were produced by the open-hearth process, 440,092 tons by the Bessemer process and 144,826 tons were rerolled.

The production of steel rails in the last ten years by weight was as follows:

Years	Under 45 Lb.	45 Lb. and Less than 85	85 Lb. and Over	Total Gross Tons
1907	295,838	1,569,985	1,767,831	3,663,654
1908	183,869	687,632	1,049,514	1,921,015
1909	255,726	1,024,856	1,743,263	3,023,845
1910	222,662	1,285,972	2,125,395	3,634,029
1911	218,758	1,067,696	1,536,336	2,822,790
1912	248,672	1,118,592	1,960,651	3,237,915
1913	270,405	†967,313	2,265,062	3,502,780
1914	*238,423	‡309,865	1,396,807	1,945,095
1915	*254,101	†518,291	1,431,811	2,204,203
1916	*295,535	†566,791	1,992,192	2,854,518

*Includes rails under 50 lb. †Includes 50 lb. and less than 85 lb.

Associated Manufacturers Act on War Revenue Tax

"Better Business" Adopted as New Slogan—Section Meetings and Election of New Officers

At a meeting of the board of governors of the Associated Manufacturers of Electrical Supplies, held in New York on May 16, a telegram was sent to the finance committee of the United States Senate and to the United States Chamber of Commerce in regard to the act on war revenue tax. It was to the effect that while it would accept without demur the decision ultimately reached, the board believed that the principle upon which the English government bases the assessment of so-called excess profit taxes is superior to that embodied in present United States legislation from the viewpoint of equity, simplicity and continuing business activity.

H. B. Crouse, president of the Crouse-Hinds Company, Syracuse, N. Y., was elected president at the meeting. He succeeds Robert K. Sheppard, the first president, who expressed a desire for rotation in the chief executive office. A. W. Berresford, Cutler-Hammer Manufacturing Company, Milwaukee, Wis., was elected vice-president. J. W. Perry, H. W. Johns-Manville Company, was re-elected treasurer. Charles K. Dustin, the general secretary, also was re-elected.

Section Officers Elected

At the meeting of the wire and cable section, held on April 17, the following officers were re-elected: LeRoy Clark, chairman, Safety Insulated Wire & Cable Company, New York; J. Nelson Shreve, secretary, Electric Cable Company, Bridgeport, Conn.; Edward F. Sawyer, treasurer, Atlantic Insulated Wire & Cable Company, New York. The line material section elected the following officers on May 4: W. R. Williams, chairman, General Electric Company, Schenectady, N. Y.; H. L. Garbutt, secretary, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; R. C. Buell, treasurer, Johns-Pratt Company, Hartford, Conn.

"Better Business," which was suggested by Robert McKean Thomas, president of the Thomas & Betts Company, New York, has been adopted as the slogan for the association.

Electric Power Club Announces Program

The annual meeting of the Electric Power Club will be held at the New Willard Hotel, Washington, D. C., on June 11 and 12. The program for the first day will be devoted to routine business and important standardization work, which will include the following classes of equipment: Fractional horsepower motors, large d.c. motors, adjustable-speed motors, d.c. generators, large polyphase motors, wearing depth of commutators.

On the second day Howard E. Coffin will make an address on general manufacturing problems in connection with the present national emergency. C. E. Patterson, comptroller of the General Electric Company, will give his paper on "Uniform Cost Accounting," and perhaps a short talk will be made by a representative of the Federal Trade Commission. There will also be a paper by a member of the club analyzing manufacturing conditions during the last two years and showing the causes of increased costs. There may also be some matters that the Army and Navy Departments may wish to present.

The idea underlying this program is to assist every member company in putting its own "house in order" and fitting itself to be of the greatest use to the nation at this time of stress.

Pole Shipments Restricted by Car Shortage

In the issue of May 5, page 853, there appeared an interview with A. L. Johnston, sales manager Electric Railway Equipment Company, Cincinnati, Ohio. The data which were presented included the average prices of tubular steel poles for each year since 1895. Attention is called to the fact that the name of Mr. Johnston's company was incorrectly printed.

In connection with the pole delivery situation mentioned in the previous article, Mr. Johnston states that the Electric Railway Equipment Company now has ready for shipment a number of pole orders but is unable to secure cars for shipment. It is understood that the manufacturers in the Ohio River and Lake districts are to be restricted to the use of but 20 per cent of the gondola cars formerly available. The reason for this ruling is stated to be that the cars are required for hauling coal and ore from the lake ports.

Mailing Catalogs for Export

Letters are frequently received at the foreign consulates from manufacturers in the United States who send their catalogs and ask for reports on the market for their supplies. As all mail matter is necessarily subjected to a good deal of wear while en route, it frequently happens that the wrapper of the catalog is torn off. The result is that a considerable number of catalogs mailed not only to the consulates but also to business houses never reach their destination, and it would seem to be to the advantage of the American exporters to see to it that their catalogs are so wrapped as to insure safe arrival. It also frequently happens that catalogs do not reach the consulate for days, or even weeks, after the arrival of the letters which announce that the catalogs have been sent. It would therefore be best to mail the catalogs in advance of the letters, if possible, in order to insure the prompt return from the consulate of the information desired.

Gear Manufacturers' Convention

Brief mention was made last week in these columns of the recently organized American Gear Manufacturers Association which held its first convention at the Hotel Schenley, Pittsburgh, Pa., on May 14 and 15. In view of the present national situation this convention will undoubtedly have a very important bearing on the efforts being put forth by the government for absolute standardization in all lines of manufacture. In addition to the four papers previously

LEFT TO RIGHT: F. W. SINRAM, FRANK HORSBURGH, F. D. HAMLIN AND H. EBERHARDT mentioned, which were presented, George L. Markland discussed the "Difficulties of Gear Standardization." An inspection trip was made to the works of the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa., where the delegates witnessed methods of manufacturing Bakelite-Micarta for gears, after which they were the guests of the Westinghouse Company at a dinner in the club rooms of the Pittsburgh Athletic Association.

The officers of the association shown in the accompanying illustration are F. W. Sinram, Van Dorn & Dutton Company, Cleveland, President; H. E. Eberhardt, Newark Gear Cutting Machine Company, Newark, N. J., vice-president; F. D. Hamlin, Earle Gear & Machine Company, Philadelphia, secretary, and Frank Horsburgh, Horsburgh & Scott, Cleveland, treasurer.

Copper Market Shows Improvement

The copper market shows some improvement, although most buyers are holding off until some definite announcement about government purchases has been made. According to the *Wall Street Journal* of May 23: "One large public utility corporation has contracted for its requirements through the last half of the year at 29 cents a pound. Representatives of leading producers mention 28 cents a pound as a probable level for deliveries in the last half of the year to be fixed by the government."

In reviewing the copper market, the *Wire Message*, the official publication of the Habirshaw Electric Cable Company and of the Electric Cable Company, says in part:

"Without some knowledge on which to base an estimate of what our government and its allies are going to require during the next six or eight months, and some positive knowledge of the terms on which sales will be made, a condition of uncertainty must prevail. One fact should be clearly understood—though it does not seem to be: Whatever concession is made to our government and its allies, it concerns only the producers making the concession, and cannot be taken as indicating what the price of copper should be, based on the law of supply and demand. This law must ultimately prevail in fixing the price to the outside public."

NEW YORK METAL MARKET PRICES

	May 3	May 26
Prime Lake, cents per lb.	31	31½
Electrolytic, cents per lb.	31	31½
Copper wire base, cents per lb.	36	36
Lead, cents per lb.	9⅞	10⅞
Nickel, cents per lb.	50	50
Spelter, cents per lb.	9½	9½
Tin, Straits, cents per lb.	58½	65½
Aluminum, 98 to 99 per cent, cents per lb.	60	60

OLD METAL PRICES

	May 3	May 26
Heavy copper, cents per lb.	24½	27½
Light copper, cents per lb.	21½	25
Red brass, cents per lb.	18½	19½
Yellow brass, cents per lb.	17½	18
Lead, heavy, cents per lb.	7¾	8½
Zinc, cents per lb.	7	7
Steel car axles, Chicago, per net ton	$41.50	$42.50
Iron car wheels, Chicago, per gross ton	$24	$30.50
Steel rail (scrap), Chicago, per gross ton	$31.50	$34.50
Steel rail (relaying), Chicago, per gross ton	$39	$39
Machine shop turnings, Chicago, per net ton	$11.00	$12.50

CURRENT PRICES FOR MATERIALS

	May 3	May 26
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38	$38
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.85	$4.00
Steel bars, Pittsburgh, per 100 lb.	$4.00	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$6.85
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl.	$2.12	$2.12
Cement (carload lots), Chicago, per bbl.	$2.16	$2.16
Cement (carload lots), Seattle, per bbl.	$2.60	$2.50
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.23
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.24
White lead (100 lb. keg), New York, cents per lb.	10¾	11¾
Turpentine (bbl. lots), New York, cents per gal.	52	49

ROLLING STOCK

Orleans-Kenner Interurban Railway, New Orleans, La., will purchase seven trail cars.

Chicago & Interurban Traction Company, Chicago, Ill., expects to purchase one semi-steel passenger motor car.

Northern Electric Company, Chico, Cal., is constructing six freight cars in its shops.

Billings Railway, Light & Power Company, Billings, Mont., which was recently incorporated for $300,000, expects to electrify the local lines which are now operated by storage-battery cars. It has been reported that this company has placed an order for several pay-as-you-enter cars.

Georgia Railway & Power Company, Atlanta, Ga., noted in the May 5 issue as expecting to build ten pay-as-you-enter cars, has decided upon the following details for this equipment:

Number	10
Delivery	During the year
Builder	Georgia Ry. & Power
Type	Pay-as-you-enter
Seating capacity	42
Weight (total)	34,000 lb.
Bolster centers, length,	21 ft. 2½ in.
Length over bumpers	44 ft. 0 in.
Length over vestibule	43 ft. 0 in.
Width over all	8 ft. 2¾ in.
Rail to trolley base	12 ft. 1½ in.
Body	Semi-steel
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Axles	Carnegie
Bumpers	Not specified
Car trimmings	Dayton Mfg. Co.
Conduits	Not specified
Control, type	K-35-G
Couplers,	Stationary draw heads and bar
Curtain fixtures,	National Lock Washer
Curtain material	Pantasote
Designation signs,	Made by company
Door mechanism,	Made by company
Fare boxes	None
Fenders or wheelguards,	Not specified
Gears and pinions	Nuttall
Hand brakes	Not specified
Heaters	Consolidated
Headlights	Golden Glow
Journal boxes	Brill
Lightning arresters	GE.
Motors	GE. No. 201, outside hung
Paint, varnish	Hildreths
Registers	International
Sanders	O-B air sanders
Sash fixtures	Dayton
Seats	Hale & Kilburn
Seating material	Rattan
Springs	Brill
Step treads	Not specified
Trolley catchers	Keystone
Trolley base	GE.
Trolley wheels,	Made by company
Trucks, type	Brill No. 39-E-1
Ventilators	Railway Utility
Wheels	33 in. and 22 in.

Oklahoma Union Traction Company, Tulso, Okla., noted in the April 21 issue as placing an order with the American Car Company, has specified the following details for part of this equipment:

	Details for Motor Cars	Baggage and Express Motor Car
Number of cars ordered	6	1
Builder	American Car	American Car
Type	Double-end pay-as-you-enter one-man safety car	Baggage and express motor car
Seating capacity	34	
Bolster centers, length	—	32 ft. 4 in.
Length over bumpers	27 ft. 9½ in.	50 ft. 0 in.
Length over vestibule	26 ft. 9½ in.	48 ft. 0 in.
Width over all	8 ft. 0 in.	9 ft. 0 in.
Rail to trolley base	12 ft. 6 in.	12 ft. 11¾ in.
Body	Semi steel	Semi-steel
Interior trim	Statuary bronze	Iron and bronze
Headlining	None, rafter finish	
Roof	Arch	Arch
Air brakes	Safety Car Devices Co.	
Axles	Brill	Brill
Bumpers	American Car. channel iron	Rico anti-climber
Car trimmings	Brill	Brill
Control, type	GE.-K-10	
Couplers	None, pull bars used	Tomlinson MCB radial
Curtain fixtures	Curtain Supply	
Curtain material	Pantasote	
Designation signs	Hunter	
Door mechanism:	Safety Car Devices Co.—air-operated	
Wheelguards	HB. Life Guards	American Car—steel Pilots
Gears and pinions	GE.	GE.
Hand brakes	American Car with Pittsburgh ratchet drop brake handle	American Car with vertical wheel
Heaters	Consolidated Car Heating Co.	
Headlights	Golden Glow S-M-95	Golden Glow T-128
Journal boxes	Brill	Brill
Lightning arresters	GE.	GE.
Motors	Two GE.-258-A inside hung	Four GE. No. 217, inside hung
Paint	—	American Car
Sanders	Keystone	Nichols-Lintern air-type
Sash fixtures	O. M. Edwards	American Car
Seats, style	American Car light-weight reversible	
Seating material	Mahogany, steel, and canvas lined rattan	
Springs	Brill	Brill
Step treads	Feralun	
Trolley catchers	Keystone	
Trolley base	GE.	GE.
Trolley wheels or shoes	GE.	GE.
Trucks, type	Brill 78-M-1 Special	Brill 27-MCB-3
Ventilators	Brill exhaust, 6 per car	
Wheels	24 in. diam.	37 in., MCB steel
Special devices	Faraday high voltage push button system	

TRADE NOTES

McIntosh & Seymour Corporation, Auburn, N. Y., has changed its New York office from 50 Church Street to 149 Broadway.

American Conduit Company, New York, N. Y., is building a new plant at Fulton, N. Y., for the manufacture of its specialties.

Driver-Harris Wire Company, Harrison, N. J., has filed notice of change in company name to the Driver-Harris Company, Inc. The capital of the company has been increased to provide for business extensions.

Kansas City (Mo.) Railways have closed a contract with the International Register Company for 600 International metal ticket fare boxes to be put in service as soon as they can be constructed.

Ohio Brass Company, Mansfield, Ohio, announces that it has received an order from the Boston Elevated Railway for 800 standard trolley crossovers of the live, rigid and adjustable types equipped with renewable cam tips.

Walter A. Zelnicker Supply Company, St. Louis, Mo., announces that A. R. Topping, who has been associated with the company for the past eleven years, has been elected secretary.

Coto-Coil Company, Boston, Mass., has been incorporated with a capital stock of $100,000 to manufacture machines for electric coil winding. Robert A. Leeson is president and Frank N. French, 95 South Street, Boston, is treasurer.

Morgan Crucible Company, New York, N. Y., has moved from 114 Liberty Street to 519 West Thirty-ninth Street. The company's factory is being moved from Brooklyn to New York, so that it will not only have larger quarters but also gain the advantage of having factory and office under one roof.

Clive Runnels, who for the last two years has been assistant to the president of the Pullman company, has been elected vice-president of the corporation. Previous to coming to the Pullman company, Mr. Runnels was connected with the Western Steel Car & Foundry Company and the American Car & Foundry Company. Mr. Runnels will continue in his capacity as assistant to President J. S. Runnels.

American Railways Equipment Company, Dayton, Ohio.—In testing out fare boxes to be installed on ten new cars only one failure of the fare box mechanism was reported after six days' trial, that failure being a pin sheared in one of the gears. Minor difficulties experienced by conductors with fare boxes were overcome after a few days' use of the new device.

Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio, wired Secretary of War Baker, as soon as war was declared, tendering the output of the sixty-eight paving brick plants in twelve states, which operate under Dunn license, for supply of wire-cut lug brick for immediate use in building military roads. This company also offered the government free advisory and inspection services of its corps of expert engineers in making surveys and constructing wire-cut lug brick roads designed for military purposes.

Wigmore, Hall & Company, 445 Pacific Electric Building, Los Angeles, Cal., has been formed to carry on the railway-supply business heretofore conducted under the name Alphonso A. Wigmore. The company is the Pacific Coast representative of the Railway Improvement Company and several other railway-supply manufacturers. This reorganization has been effected to permit the enlargement of the company's sales territory and the increase of lines handled. Mr. Wigmore has been a Pacific Coast railway sales representative for many years, while Charles Watts Hall is a railway engineer conversant with the actual installation of railway equipment. The company will be pleased to hear from manufacturers who desire to increase their business on the Pacific Coast.

General Railway Signal Company, Rochester, N. Y., announces that C. O. Poor, formerly assistant resident manager of the Chicago district and later in charge of this company's munition plant, has been appointed president and general manager of the General Railway Signal Company of Canada, Ltd., and is now located at Montreal. Mr. Poor came to this company in 1905 from the Hall Signal Company. From 1905 to 1912 he was superintendent of the company at the Rochester plant and in 1912 was made assistant resident manager at Chicago. V. I. Smart has been appointed consulting engineer. F. H. Jones, who has been with the company for more than twelve years, has returned to his former position as assistant resident manager of the Chicago district, and will be located in the Peoples Gas Building, Chicago.

Bare Wire Company, Inc., New York, N. Y., has been incorporated under the laws of the State of New York with a capitalization of $500,000. The offices of the company are at 10 East Forty-third Street. This new company has acquired from the N. Y. C. & H. R. R. R. a valuable tract of land in Yonkers. It will proceed at once to erect a building and instal the most modern machinery for the manufacture of all forms of bare copper wires and cables. The company is closely affiliated with the Habirshaw Electric Cable Company and the Electric Cable Company. One of the principal purposes of the new company is to assure the two above-named companies at all times an adequate supply of every size of wire needed to enable them to give prompt and efficient service to their customers. The incorporators of the Bare Wire Company are Edwin W. Moore, J. Nelson Shreve, G. F. Waterbury, John S. Keith and Thomas C. Perkins.

ADVERTISING LITERATURE

W. N. Matthews & Brother, St. Louis, Mo.: A folder descriptive of their "Scrulix" anchors.

Hickey & Schneider, New York, N. Y.: Bulletin No. 50 descriptive of Burn-Boston carbon-ground cones.

V. V. Fittings Company, Philadelphia, Pa.: A folder descriptive of its safety switches designed particularly to protect the operator as well as the entire installation.

MacGovern & Company, New York, N. Y.: A catalog on power machinery and contractors' equipment. Contains lists of electrical, hydraulic, steam and gas machinery available for immediate delivery.

B. F. Goodrich Rubber Company, Akron, Ohio.: A thirty-six-page bulletin on Goodrich products, including packing, belting, molded goods, insulated wire, battery jars and miscellaneous hard rubber goods.

Westinghouse Church Kerr & Company, New York, N. Y.: A bulletin, "The 1916 W. C. K. City." All the buildings shown, costing more than $60,000,000, were built during 1916, and all of them were designed and constructed throughout by the Westinghouse Church Kerr organization.

General Electric Company, Schenectady, N. Y.—Bulletin No. 43,503 on "The Application of Novalux Units to Ornamental Street Lighting." This bulletin contains thirty-six pages illustrating correct lighting units for business streets, residential streets and outlying districts.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: A neat and attractive publication of the address, "A Plea for Defense of Human Rights and Liberty" presented by President Woodrow Wilson before the Sixty-seventh Congress, on Monday, April 2, 1917.

Ingersoll-Rand Company, New York, N. Y.: Bulletin 3311 covering Imperial type X duplex steam-driven compressors. Tables of sizes and capacities given; also Bulletin 8507 on Little David pneumatic drills. Models shown with recommendations as to character of work for which they are best adapted.

La Clede-Christy Clay Products Company, St. Louis, Mo.: A bulletin, "Now What Is Going to Happen?" The relations between consumers' demand, visible raw materials and average price levels for the last three years are illustrated appropriately. A short résumé of present market conditions is also given.

William P. Bonbright & Company, New York, N. Y.: A twenty-page pamphlet, "United States War Loans." This gives a brief but comprehensive outline of the loans issued by the United States government since Revolutionary days. The general features of the present Liberty Loan are discussed, and the full text of the law authorizing it is appended.

No Imaginary Savings About Peacock Brakes

Irish and other folk stories make it plain that wrongly gotten gold was really imaginary and had a habit of turning to ashes at spending time.

Not unlike, we think, to the imaginary dollars saved by purchasing an inferior brake—

For when the accounts are balanced, accidents and higher maintenance have turned the saving into ashes sure enough.

There is no illusive first-cost saving about **Peacock Brakes.**

They are sold at a price which permits us to give you a brake that saves **real** money for you from the day that you put it to **use.**

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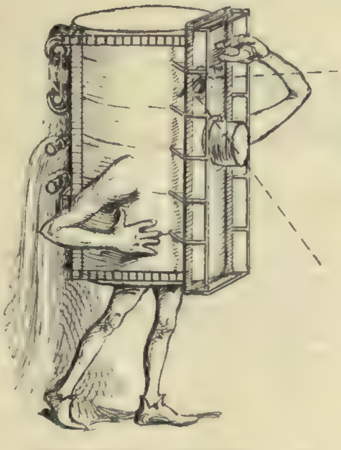
He finds new weed uprisings to subdue



Stop hand-weeding etc. —it's only temporary relief.

Use the ATLAS "A" method— it's permanent

Atlas "A" method of weed eradication is constantly finding new tracks to clean. Almost daily railways are adopting this easy chemical method of permanently curing their weed grown tracks. Are you one of these roads? The Atlas "A" method supplies the chemical and sprinkling equipment.

Part 2—Next week

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Columbia-Made Coils

You know that Columbia-made coil winding and taping machines are standard on many systems.

But do you know that we also make armature and field coils for all types of motors?

If you are not completely equipped to turn out all the coils you need in good time and at an economical figure, give us a chance to show you.

Quick Coil Delivery and Low Prices

Columbia quality, price and delivery are also embodied in these items:

TOOLS

- Armature and axle straighteners
- Armature shaft straighteners
- Armature buggies and stands
- Babbitting molds
- Banding and heading machines
- Car hoists
- Car replacers
- Coil taping machines for armature leads
- Coil winding machines
- Pinion pullers
- Pit jacks
- Signal or target switches
- Tension stands

CAR EQUIPMENT

- Armature and axle bearings
- Armature and field coils
- Bearings (axle and armature)
- Brush-holders and brush-holder springs
- Brake, door and other handles
- Brake forgings, riggings, etc.
- Car trimmings
- Commutators
- Controller handles
- Forgings of all kinds
- Gear cases (steel or mall. iron)
- Grid resistors
- Third-rail shoe-beams and accessories
- Trolley poles (steel) and wheels

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It comes to your shop all cut to size and ready to put on.

There is a definite economy in its use.

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Monadnock Bldg., San Francisco, Cal.

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Here is an idea for your safety-first contests, economy campaigns, welfare meetings and railway outings.

See what one general manager writes: "The idea which you present has slipped our attention heretofore, but at our next prize contest we will offer the Electric Railway Journal for one year as a prize."

That's all there is to the idea.

You can list as a prize for **your** next employees' contest a year's paid subscription to the Electric Railway Journal—

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The cost ($3.00) is insignificant.

And the receipt of the Journal at his home by one who is sufficiently advanced in thought to win one of your prizes will assure that he will obtain from reading this paper not only ideas of direct value to your company far out of proportion to the subscription cost, but also will be broadened mentally.

Make a note of this suggestion and when listing prizes for subsequent events include a subscription to the

ELECTRIC RAILWAY JOURNAL

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DUFF
GENUINE BARRETT
JACKS

are old Standbys at Atlanta

Atlanta, however, is only one of the many cities in this country and abroad whose electric railways carry Duff Genuine Barrett Emergency Jacks on their cars. They are paying for themselves many times over on both small and large systems.

They afford prompt relief in tie-ups, take care of rescue work before the arrival of the emergency wagon and reduce damage claims to a minimum.

A Duff Emergency Jack should be carried on every car. The price of many jacks is often saved by the presence of one jack in a single accident.

The latest Duff 150-page catalog is the key to the lifting problems of the track, yard, bridge and shop. It illustrates and describes the most complete line of Lifting Jacks in the world. Send for it today.

THE DUFF MFG. CO., (Established 1883) **Pittsburgh, Pa.**

New York **Chicago** **Atlanta** **San Francisco** **St. Paul**

Safety—Economy—Efficiency
GRIFFIN F. C. S. WHEELS

Maximum Mileage

Minimum Cost

For Street and Interurban Railways
We have adequate facilities at each foundry for mounting wheels on axles

GRIFFIN WHEEL COMPANY

McCormick Building, Chicago, Ill.

FOUNDRIES

Chicago Detroit Boston Los Angeles Denver St. Paul Tacoma Kansas City

---

Steel for Service

There was a time when first cost of all articles, including wheels, had a greater bearing with the operators of electric railways as to choice of purchase than to-day.

At present the importance of having the best obtainable wheels for safety as well as wearing quality is not overlooked by the most efficiently operated railways.

When ordering new cars or replacing wheels on old equipment why not specify

Carnegie Rolled Steel Wheels?

The mark of quality — CARNEGIE — It protects the user

Carnegie Steel Company

General Offices, Pittsburgh, Pa.

873

The demand for our material is so great that we earnestly recommend our customers to anticipate their needs as much as possible.

STANDARD
STEEL WORKS CO.
Morris Building Philadelphia

New York
Chicago
St. Louis
Pittsburgh
San Francisco
Richmond

Portland
Havana, Cuba
London, Eng.
Melbourne, Aust.
Monterey, Mex.
Mexico City

EMB Grid Resistors

ARE MADE RIGHT AND STAY RIGHT

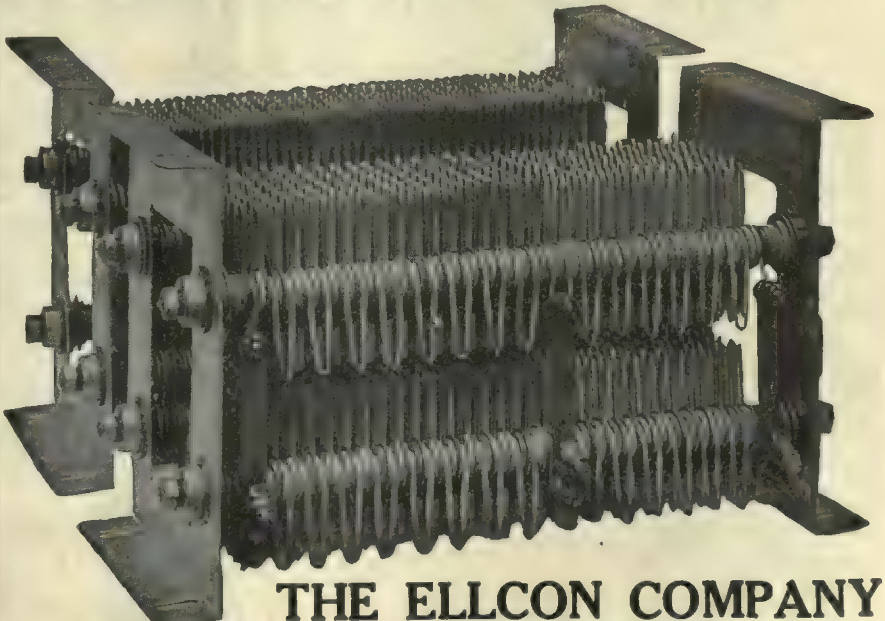
No resistors get more abuse than those under a car.

They are abused electrically by careless operation of the controller.

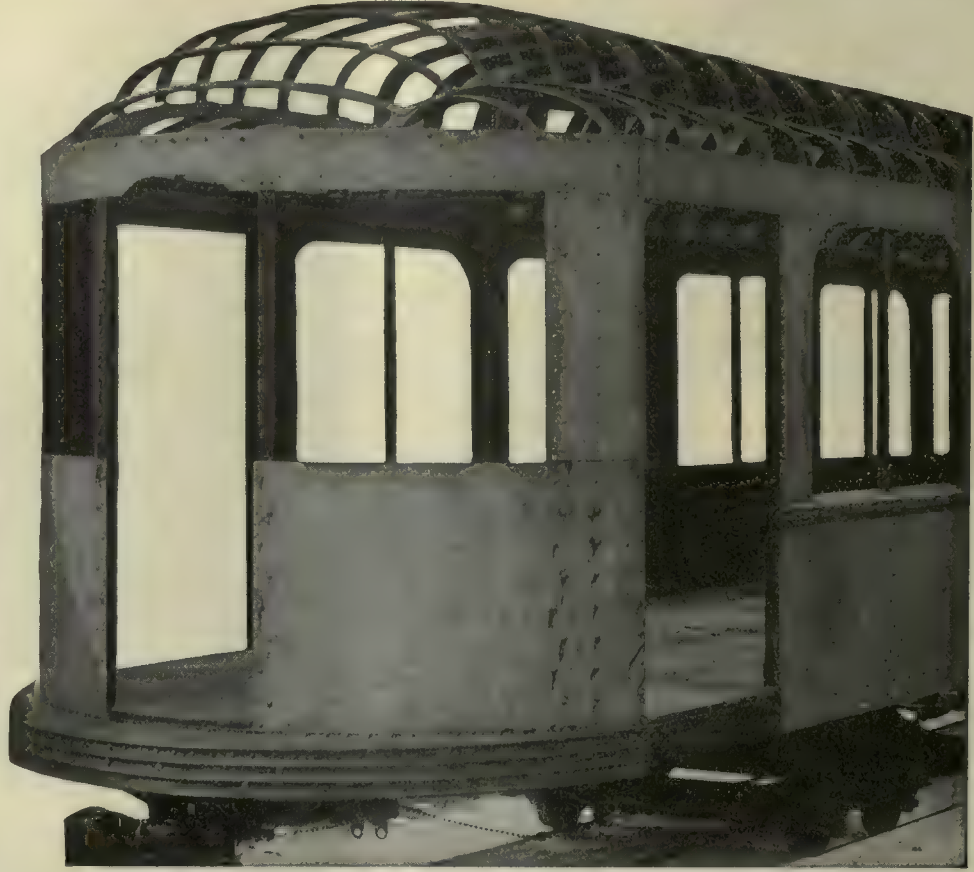
They are abused mechanically by exposure to dusty, muddy and stone-littered streets.

Until the arrival of E M B drawn, non-corroding grid resistors, troubles from these sources seemed unavoidable.

E M B grid resistors actually have made this part of your equipment troubleproof.



THE ELLCON COMPANY
50 Church Street, New York



Jewett
Steel
Cars

Represent highest class workmanship from a thoroughly modern plant.

Let us figure on your new equipment.

The Jewett Car Company
Newark, Ohio

3263

IF YOU WANT PROOFS

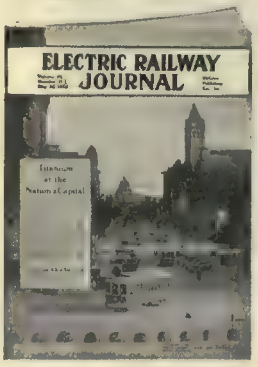
of your advertisements, and time to return them with corrections

Copy Must Be in Our Hands Two Weeks in Advance of Publication Date

Copy Changes. If no proofs are desired your advertisements should be in our hands Wednesday of the week preceding date of publication, otherwise your latest advertisement in accordance with schedule will be repeated.

New Advertisements (not changes of copy) can usually be accepted up to noon Wednesday of the week of publication, but no guarantee can be given as to location or proofs or indexing.

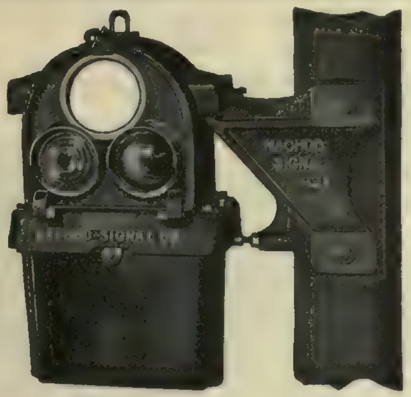
Searchlight Advertisements (Proposals, Wants, For Sale, etc.) received as late as 10 A. M. Thursday will be published if there is space available in the pages that go to press last. The paper is dated and mailed Saturday.



THESE are not arbitrary rules. We do our best to give our advertisers what they want—work overtime if necessary—but each advertising form has to be on the press at a specified time. That is why we cannot guarantee proof or location unless we have copy on time. We want our advertising space to work at maximum efficiency for our advertisers.

The Paper is dated and mailed Saturday

Electric Railway Journal, 239 W. 39th St., New York



You Are Never in Doubt

when your road is protected by

Nachod Signals

No matter what your road conditions are, a Nachod will take care of them. There are 7 types of Nachods for all service, from high speed interurban to city travel.

Write for information.

Nachod Spells Safety.

NACHOD SIGNAL CO., Inc.
Louisville, Ky.

PACIFIC COAST REPRESENTATIVES
ECCLES & SMITH CO., Portland, Oregon, San Francisco, Cal., Los Angeles, Cal.

2224

STEEL POLES For every pole purpose

Bates Steel Poles in use by the DES MOINES CITY RAILWAY, Des Moines, Iowa, U. S. A.

Strongest STEEL POLE of like weight in the world.
Best STEEL POLE in the world for electric railway trolley service.
Most artistic STEEL POLE in the world for any service.
We make the lowest prices.
We have constantly on hand about two thousand tons of steel and can make immediate shipments.
A full line of convenient malleable fittings.
Our steel pole TREATISE tells a big story, ask for it.

BATES EXPANDED STEEL TRUSS CO.
208 South La Salle St., Chicago, Ill., U. S. A.

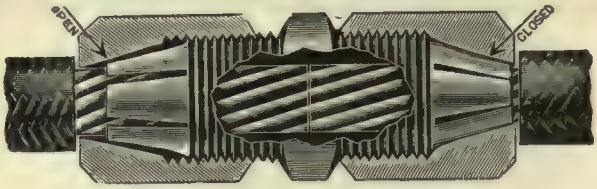
ALUMINUM

Railway Feeders

And all kinds of Electrical Conductors

Aluminum feeders are less than one-half the weight of copper feeders and are of equal conductivity and strength. If insulated wire or cable is required, high-grade insulation is guaranteed. Write for prices and full information.

Aluminum Company of America
Pittsburgh, Pa.



Make Splices Easy to Open Up, Too

All you need is a wrench to open up a splice or make it up again, if you use

FRANKEL SOLDERLESS CONNECTORS

Wonderfully simple; Mechanically and electrically strong. Withstand big overloads. Get our booklet.

Factory:
177-179 Hudson St., New York

MAKERS OF THE BEST ONLY
FRANKEL
CONNECTOR CO. INC N.Y.

Sales Rooms:
733-735 Broadway New York

FEDERAL SIGNAL CO.

ALBANY, N. Y.

CONSULT OUR ENGINEERS ON YOUR SIGNAL REQUIREMENTS

52 Vanderbilt Avenue, New York Monadnock Block, Chicago
118-130 New Montgomery St., San Francisco, Cal.

AETNA INSULATION LINE MATERIAL

Third Rail Insulators, Trolley Bases, Poles, Harps and Wheels, Bronze and Malleable Iron Frogs, Crossings, Section Insulators, Section Switches.

Albert & J. M. Anderson Mfg. Co.
289-93 A Street, Boston, Mass.
Established 1877.
Branches—New York, 135 B'way, Philadelphia, 429 Real Estate Trust Bldg. Chicago, 105 So. Dearborn St. London, 48 Milton Street.

AETNA

Chapman

Automatic Signals

Charles N. Wood Co., Boston

DISPATCHER

The Simmen System

MOTORMAN

Direct Contact Between
Dispatcher and Motorman
Write for Details
SIMMEN AUTOMATIC RAILWAY SIGNAL CO
1575 Niagara St., Buffalo, N. Y.

THE LINDSLEY BROTHERS CO.
Western "Good Poles Quick" Northern
Quick Shipments from our Minneapolis Yard
Rooms 832-834, 72 West Adams St., Chicago, Ill.
Spokane - St. Louis
Butt Treating Open Tank and "Hot and Cold" Processes

MARSH & McLENNAN FIRE INSURANCE
Special Attention Given to Traction Insurance
Insurance Exchange, CHICAGO
19 Cedar St. NEW YORK
1615 California St. DENVER
314 Superior St. DULUTH
300 Nicollet Ave. MINNEAPOLIS
Ford Bldg. DETROIT
17 St. John St. MONTREAL
23 Leadenhall LONDON
THESE OFFICES WILL GIVE YOU THE BEST THERE IS IN INSURANCE SERVICE

Michigan Western
CEDAR POLES
POSTS, TIES AND PILING
BUTT TREATING
The Valentine-Clark Co.
General Office: Minneapolis, Minn.
Toledo, Ohio; Chicago, Ill.; Kansas City, Mo.; St. Maries, Idaho.

POLES
NORTHERN WHITE CEDAR WESTERN RED CEDAR
BUTT TREATING
PAGE & HILL CO.
MINNEAPOLIS, MINN.

Bare and Insulated Wires and Cables.
John A. Roebling's Sons Company, Trenton, N. J.

TREATED POLES, CROSS ARMS, TIES, TIMBERS, PAVING BLOCKS
CAPACITY 100,000,000 FEET B. M. PER ANNUM
SEND FOR PAMPHLET
International Creosoting & Construction Co.
Address all communications to Office, Galveston, Texas
Works: Beaumont, Texas Texarkana, Texas

DISFICO
"WHALEBONE"
Fibre Track Insulation
DIAMOND STATE FIBRE CO.
Elsmere, Del. Bridgeport, Penna. Chicago, Ill.

"NATIONAL" Tubular Steel Poles
for Telegraph, Telephone, Electric Light and Electric Railway Construction. Write for literature
National Tube Co.
PITTSBURGH, PA.

POLES WESTERN CEDAR PILING
We brag about the SERVICE we give
B. J. CARNEY & CO.
E. B. BRANDE, Manager 819 Broad Street Grinnell, Ia.
M. P. FLANNERY, Manager Spokane, Wash.
WM. MULLER & CO., 1729 McCormick Bldg., Chicago.
Commit us to memory.

The Trenton
Three Section Tower Outfits to fit any make of chassis.
Write for literature and prices.
J. R. McCARDELL & CO., Trenton, N. J.

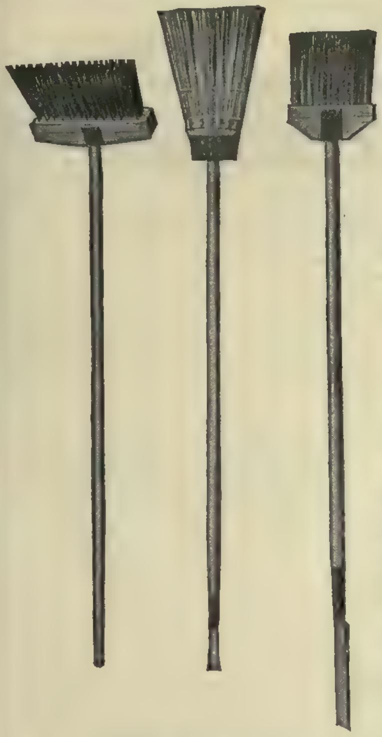
Transmission Line and Special Crossing Structures, Catenary Bridges
WRITE FOR OUR NEW DESCRIPTIVE CATALOG.
ARCHBOLD-BRADY CO.
Engineers & Contractors SYRACUSE, N. Y.

Aristos "COPPERWELD"—Copper Clad Steel Wire—
Beats Solid Copper 40 Ways
Cheaper—Lighter—Stronger—Higher Elastic Limit—Costs Less to Maintain
GET DATA
Made from the product of Copper Clad Steel Co. of Pittsburgh, Pa.
Western Sales Office Steel Sales Corporation Chicago, Ill.
PAGE WOVEN WIRE FENCE CO. Monessen, Pa.
Eastern Sales Office Page Woven Wire Fence Co. 30 Church St., New York

TOOLS
for all classes of electrical construction and repair work. Write for catalog.
Mathias Klein & Sons Canal Station 25 Chicago

Peirce Forged Steel Pins with Sheet Steel Thimbles
Your best insurance against insulator breakage
Hubbard & Company
PITTSBURGH, PA.

A Great Combination



No. 1 to sweep crossings.

No. 2 to handle light dirt and snow in the frogs, switches, and curves.

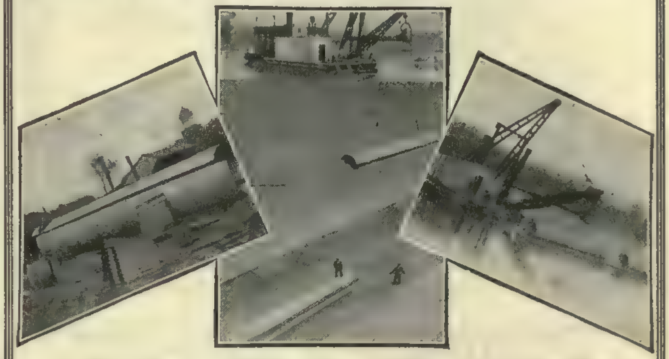
No. 3 to remove ice, slush and mud from the same places and a chisel point on the end of the handle to loosen the ice and crust.

No. 1 and No. 3 contain Flat Steel Tempered Wire, and nothing superior can be produced. Serviceable all the year round. Your road is not complete without them.

Write for Prices.

J. W. PAXSON CO., Mfrs.
1021 N. Delaware Ave., Philadelphia, Pa.

No Limit to the Adaptability
of
"ACME" (NESTABLE) CULVERTS



In This Case a 500-Ft. Intake Under the Connecticut River

1. Setting up "ACME" (Nestable) Corrugated Metal Culverts in 50-ft. lengths on river bank.
2. Divers bolting and installing "ACME" (Nestable) Culvert intake in ditch under river.
3. Dredge rigged with derrick for lowering 50-ft. break-joint sections of "ACME" (Nestable) Pipe.

"ACME" (Nestable) Corrugated Metal Culverts are eminently practicable for intakes, outlets, conduits, storm water sewers, casings for electric wires, cables, gas mains, water pipes, collapsible forms for piers, reinforcing for concrete, etc. Consider their adaptability for your requirements.

Ask for our catalog G-3, illustrating installations all over the world—and get our prices for prompt delivery.

THE CANTON CULVERT & SILO CO.
MANUFACTURERS
CANTON, OHIO, U.S.A.

The Rail Joint Company
61 Broadway, New York City

100% Rail Joint

Makers of Continuous, Weber, Wolhaupter and 100% Rail Joints
Standard—Insulated—Step—Frog and Switch Types
Protected by Patents
Grand Prize, San Francisco, 1915 4

SPECIAL TRACK WORK

Built to withstand severe service

SWITCHES
FROGS
CROSSINGS
and
COMPLETE
LAYOUTS

New York Switch & Crossing Co.
Hoboken, New Jersey

HIGHEST QUALITY

TRACK SPECIAL WORK

HIGHEST QUALITY SAFETY DURABILITY
FROGS CROSSINGS SWITCHES STANDS
F & C Co.

WE MAKE THIS GRADE ONLY

CLEVELAND FROG & CROSSING CO.
CLEVELAND OHIO

AWARDED
PANAMA PACIFIC INTERNATIONAL EXPOSITION GRAND PRIZE

American
Rail Bonds

Crown
United States
Twin Terminal
Soldered

American Steel & Wire Company
Chicago New York Cleveland Pittsburgh Worcester Denver

Export Representative: U. S. Steel Products Co., New York
Pacific Coast Representative: U. S. Steel Products Co.
San Francisco Los Angeles Portland Seattle

Have You Ever Analyzed the Heap of Junk in Your Yard?

Do you realize that a large percentage of the tubes, flues, and grates that compose it have had their uselessness hastened by bad feed water conditions?

Scale, Corrosion, Foaming, Pitting and Bagging quickly reduce boilers to junk. Overheating in an effort to offset the reduced steaming efficiency caused by scale, speedily burns out the tubes, and steam leaks produce bad effects on the grates, and also have a tendency to destroy the brick work of the furnace.

It is therefore easily appreciable that

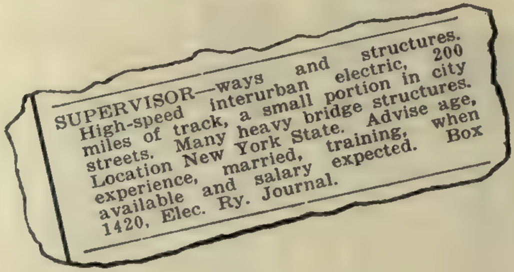
Dearborn Treatment

which is a certain corrective for all feed water troubles, prolongs the life of not only the water containing parts of your boiler, but saves furnace parts as well.

Dearborn Treatment can be depended upon to keep the boilers in good condition. It is made in each case to handle the conditions shown by analysis of the water, and provides reagents for all the injurious mineral salts contained, so that it not only prevents scale formation, but overcomes corrosion, pitting and foaming.

Dearborn Chemical Company
McCormick Bldg., Chicago

We can help YOU, too



SUPERVISOR—ways and structures. High-speed interurban electric, 200 miles of track, a small portion in city streets. Many heavy bridge structures. Location New York State. Advise age, experience, married, training, when available and salary expected. Box 1420, Elec. Ry. Journal.

I wish to congratulate you on the results obtained.

Within two days after first insertion, replies were received and I have to date a total of twenty very desirable applicants. H. J. Clark,
Chief Engineer.

Above ad cost only $2.05 an insertion and was published but three times. This is only one example among many of the pulling power of the Journal's Searchlight Section.

The Babcock & Wilcox Company

85 Liberty Street, New York

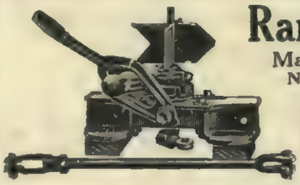
WATER TUBE STEAM BOILERS

Steam Superheaters Mechanical Stokers

Works: BARBERTON, OHIO—BAYONNE, N. J.

BRANCH OFFICES:

ATLANTA, Candler Building.
BOSTON, 35 Federal St.
CHICAGO, Marquette Building.
CINCINNATI, Traction Building.
CLEVELAND, New England Building.
DENVER, 435 Seventeenth St.
HAVANA, CUBA, Calle de Aguiar 104.
HOUSTON, TEX., Southern Pacific Bldg.
LOS ANGELES, I. N. Van Nuys Bldg.
NEW ORLEANS, 533 Baronne St.
PHILADELPHIA, North American Building.
PITTSBURGH, Farmers' Deposit Bank Bldg.
SALT LAKE CITY, 705-6 Kearns Bldg.
SAN FRANCISCO, Sheldon Bldg.
SAN JUAN, Porto Rico, Royal Bank Bldg.
SEATTLE, Mutual Life Building.
TUCSON, ARIZONA, Santa Rita Hotel Bldg.



Ramapo Iron Works

Main Office, Hillburn, N. Y.
New York Office: 30 Church St.

Automatic Switch Stands, T-Rail Special Work, Manganese Construction, Crossings, Switches, Etc.

DIXON'S Graphite Brushes

overcome the scoring of commutators and the resulting noise and sparking.
If you have brush troubles, Booklet 108-M will be of interest to you.

Made in JERSEY CITY, N. J., by the
JOSEPH DIXON CRUCIBLE COMPANY
Established 1827

Kilby Frog & Switch Co.

BIRMINGHAM, ALA.

Tongue Switches, Mates, Frogs, Curves and Special Work of all kinds for Street Railways

---

GECO

GREEN CHAIN GRATE STOKERS
For Water Tube and Tubular Boilers
GREEN ENGINEERING CO.
East Chicago, Indiana

Bulletin No. 1—Green Chain Grate Stokers
Bulletin No. 2—Geco Steam Jet Ash Conveyors

Packard

They're reliable — they must be.
We use them in our own products.

INSULATING
VARNISHES

Keep your equipment earning dividends.
A kind for every condition met with in electric traction operation.

Write for Insulation Bulletin

The Packard Electric Company
Warren, Ohio

Full Power with High or Lower Adjustment

Many emergencies requiring a powerful jack present a difficulty in bringing the jack to bear on the load. The

Buckeye Emergency Jack No. 239 Special

saves time, strength and trouble. The many positions to which it is adjustable easily solve perplexing lifting problems. Full details in our catalog. Write for it.

The Buckeye Jack Mfg. Co.
Alliance, Ohio

3

Repair Shop
Machinery
and Cranes

Built by

NILES-BEMENT-POND CO.

111 Broadway, New York

Boston Philadelphia Pittsburgh Chicago
St. Louis Birmingham, Ala. London

KINNEAR Steel Rolling Doors
FOR CAR HOUSES

Compact, Durable, Easily and Speedily Operated and Fireproof. Openings of any size may be equipped and the doors motor-operated if desired. Manufactured by the

KINNEAR MANUFACTURING CO., Columbus, Ohio
BOSTON PHILADELPHIA CHICAGO

INSULATING TAPE
of
Quality

STANDARD
Woven Fabric Co.
Walpole, Mass.

FORD TRIBLOC

A Chain Hoist that excels in every feature. It has Planetary Gears, Steel Parts, 3½ to 1 factor of Safety. It's the only Block that carries a five-year guarantee.

FORD CHAIN BLOCK & MFG. CO.
142 Oxford Street, Philadelphia

The Big Three
**D & W Fuses, Deltabeston Wire
Delta Tape**
D & W Fuse Co., Providence, R. I.

THE CUTTER ELECTRICAL AND MANUFACTURING CO.
CIRCUIT I-T-E BREAKERS
PHILADELPHIA

**I. T. E.
Circuit Breakers**

for heavy street railway work are the best obtainable. Write for New Complete Catalogue.

Foster Superheaters
Insure uniform superheat at temperature specified
Power Specialty Company
111 Broadway, New York City

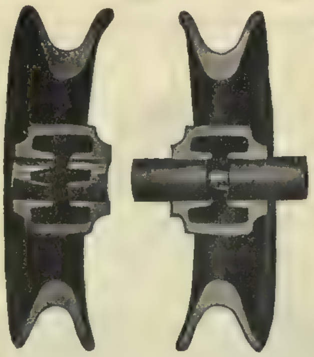
Murphy
AUTOMATIC
Furnace

232

CONSERVES energy and triples the steaming capacity of your boilers. Write for Catalog "C."

MURPHY IRON WORKS
Detroit, Mich. U.S.A.

WATER SOFTENING OR FILTRATION
FOR BOILER FEED AND ALL INDUSTRIAL USES
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.



1980 Revolutions per Minute!

Do you know that a 6-inch trolley wheel, on a car running thirty miles an hour, revolves at the rate of 1980 r.p.m.?

Do you know that fast moving machinery must have force feed lubrication to prevent friction and burnt-out bearings?

Do you know that the

Hensley Trolley Wheel

is the only wheel manufactured with the force feed type of lubrication?

The Hensley Trolley Wheel needs oiling but twice a week and only three seconds is required to do it.

You'll need the Hensley catalog. Get it *now*.

Hensley Trolley & Mfg. Co.
Detroit, Mich.

WE CAN CUT YOUR COST OF HEATING CURRENT

Write for THERMOSTATIC CONTROL INFORMATION

GOLD

ELECTRIC HEATERS Cut Installation and Maintenance Charge.
VENTILATORS Also Ventilate in Stormy Weather.
THERMOSTATS Save Current.
ORIGINATED the use of NON-CORROSIVE Wire for Electric Car Heaters.
ORIGINATED The Ventilated Coil Support.

LET US FIGURE ON YOUR NEXT REQUIREMENTS

Gold Car Heating & Lighting Co., 17 Battery Pl., New York

Get away from unreliable batteries

The Consolidated Buzzer System

operates directly from the line and always gets plenty of juice. No metal is exposed to the passenger's touch. The only dependable system.

Consolidated Car-Heating Co.
New York Albany Chicago

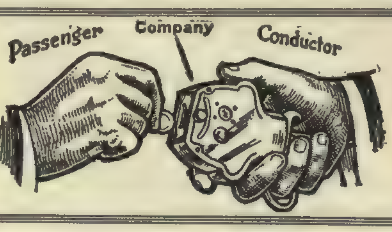
International Specialties Talk for Themselves

Money-counting fare boxes; Coin and metal ticket counting fare boxes; Coin registers; Coin and transfer registers; Coin, metal ticket and transfer registers; Motor-driven registers; Round and square registers; Badges; Punches and Bell cord.

THE INTERNATIONAL REGISTER CO.
15 South Throop St., Chicago

HEATING AND VENTILATING YOUR CARS is the problem to-day. Let us show you how to do both with one equipment. Now is the time to consider this change before you start your cars through the shops for overhauling. Kill two birds with one stone.

THE PETER SMITH HEATER COMPANY
1759 Mt. Elliott Ave., Detroit, Mich.



Direct Automatic Registration By the Passenger

Rooke Automatic Register Co.
Providence, R. I.

Ventilation—Sanitation—Economy—Safety

All Combined in

The Cooper Forced Ventilation Hot Air Heater

Patented September 30, 1913. Ask for the full story

We also Manufacture Pressed Steel Hot Water Heaters

THE COOPER HEATER CO. CARLISLE, PA.

COMMUTATORS

Original Manufacturers' Dimensions

Write for new bulletin

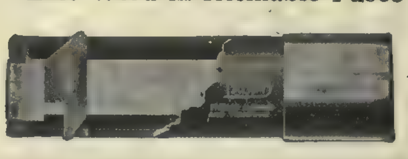
THE EUREKA CO., North East, Pa.

The Best Shade Rollers for Cars

SPECIAL shade rollers for cars, that will last and give satisfaction for years, and yet cost but little more than the poorest you can buy, are made by the Stewart Hartshorn Co., E. Newark, N. J. This company is by far the largest shade roller manufacturer in the world. It is able to give high quality at lower prices because of the enormous output. Write for catalog, stating wants. You are always protected when you buy shade rollers if they bear the signature Stewart Hartshorn

---

Last Word in Refillable Fuses



TRADE AUM MARK

SAVE
60 to 80 per cent

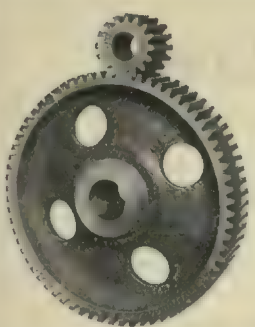
Sole Manufacturer
A. F. DAUM
Pittsburgh, Pa.

The Standard for Speed, Accuracy, Durability

B-V Visible Punch

Look for this
B-V.
Trade Mark

BONNEY-VEHSLAGE TOOL COMPANY
124 Chambers Street, New York City
Factory, Newark, N. J.



"Another wornout pinion to be replaced."

Then try

NUTTALL B. P.

Guaranteed to give 4 times the life of untreated cast steel.

Is replacing broken pinions a big item in your maintenance cost? If so, follow the above advice and you won't go wrong.

Use your own figures to prove the saving to yourself.

Grade	Relative Service	Relative First Cost	Cost of Cast Steel for Equal Life	Saving in Ultimate Cost
C. S.	100%	100% $30.00	100% $30.00	....
B. P.	400%	130% 39.00	350% 120.00	$81.00 67%

Write for bulletin No. 17 and the Red Book

NUTTALL
PITTSBURGH

"Van Dorn"

Gears and Pinions

Peak loads, steep grades, sudden starting, stopping and reversing search out the weak spots of ordinary gears and put the trucks into the repair shop. Van Dorn gears are made with just these destroyers in mind. Our long experience taught us how.
Our years of specialized experience in making gears is worth money to you.

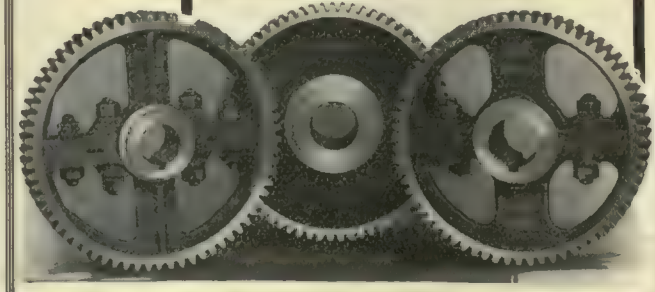
Let us quote on your needs. Write Dept. A. B.

THE VAN DORN & DUTTON CO.

Gear Specialists

CLEVELAND, OHIO

Sales Offices: Chicago, St. Louis, Kansas City, Boston, New York, Atlanta, Cincinnati, Toronto, Milwaukee, San Francisco, Denver.



The Kalamazoo Trolley Wheels

have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.

THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

Holden & White

Electric Railway Sales Distributors for:

Wasson Air-Retrieving Trolley Bases. (U. S.)
Garland Ventilators.
Perry-Hartman Self-Centering Center Plates and Anti-Friction Side Bearings.
Watson Car Lighting Regulator.
Anderson Brake Slack Adjusters.

Chicago District Representatives for:

Drew Line Material.
Columbia Car & Shop Equipment.
Miller Trolley Shoe.
Lincoln Rail Bonding and Bonds.

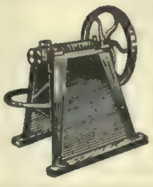
1508 Fisher Building CHICAGO

RAILWAY UTILITY COMPANY

Sole Manufacturers

"HONEYCOMB" AND "ROUND JET" VENTILATORS
for Monitor and Arch Roof Cars, and all classes of buildings; also
ELECTRIC THERMOMETER CONTROL
of Car Temperatures.

721 W. FULTON ST. *Write for* **1328 BROADWAY**
Chicago, Ill. *Catalogue* **New York, N. Y.**



Saved from the Ashes as many tickets are, means nickels loss to you. Avoid the risk.
Patten Ticket Destroyer is used right in the office under the eyes of trustworthy employes.
It mutilates beyond redemption.
Scrap sold will pay for the machines.

Ask us for Circular J.

PAUL B. PATTEN CO.

78 Lafayette St., Salem, Mass. U.S.A.

Use them in your terminals—

PEREY TURNSTILES or PASSIMETERS

Faster than the ticket seller

Perey Manufacturing Co., Inc.
30 Church Street, New York City

"GLOBE" The Universal Ventilator

Globe Ventilator Co., Troy, N. Y.

Service

You get more than simply BRAKE SHOES when you use our Product.

You get the advantage of our constant effort to improve our product for your service.

You get the earnest co-operation of our engineers to assist you in getting the full quota of service from each Brake Shoe applied.

Miles of service from the Brake Shoe are more to be desired than pounds of scrap.

All of which means increased efficiency and decreased cost of Brake Maintenance.

American Brake Shoe & Foundry Co.
30 Church St., New York
McCormick Bldg., Chicago **Chattanooga, Tenn.**

Are you interested in an

All-Steel Double Truck Car

seating 46 people
and weighing
complete 26,000 pounds?

If you are,
write us
"The Quality Shops"

St. Louis Car Company

The Baldwin Locomotive Works

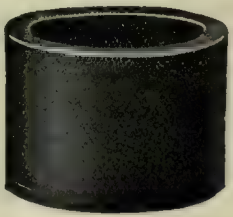
Philadelphia, Pa.

ELECTRIC MOTOR and TRAILER TRUCKS

LONGWEAR BUSHINGS

For Brake Gear

Hardened
Steel
Accurate
Uniform



also
LONGWEAR
BRAKE PINS
to
Specifications

E.G.Long Company
50 Church Street **New York**

MASON SAFETY TREADS—prevent slipping and thus obviate damage suits.

KARBOLITH CAR FLOORING—for steel cars is sanitary, fireproof and light in weight.

STANWOOD STEPS—are non-slipping and self-cleaning.

Above products are used on all leading railways. For details address

AMERICAN MASON SAFETY TREAD CO.
Main Offices: Lowell, Mass.
Branch Offices: Boston New York City, Chicago, Philadelphia, Kansas City, Cleveland, St. Louis.

UNIVERSAL ANTI-SLIP TREADS

cars and station steps.

Universal Safety Tread Company
Waltham, Mass.

The Eclipse Railway Supply Co.

CLEVELAND, OHIO

Manufacturers of the

ECLIPSE LIFE GUARD **ECLIPSE WHEELGUARD**
ECLIPSE TROLLEY RETRIEVER **ACME FENDER**

VAN DORN COUPLERS

are made for every condition and requirement. M. C. B. Pin and Link, Car and Air, in all sizes and types.

VAN DORN COUPLER CO.
2325 So. Pauling St., Chicago, Ill.

The On-Time Advertiser

who gets his copy and cuts to us well before the day his advertisement should go to press, gets better type composition, better location and a better opportunity to make necessary corrections on the proofs, which can then be submitted before publication.

The Last-Hour Advertiser

whose copy and cuts come in at the last minute or even later, gets the best attention we can possibly give him. We work overtime to do what we can for him. But the lack of sufficient time makes it physically impossible to do as well for him as for the advertiser whose instructions come in well before the last hour.

Get Your Copy and Cuts in Early

Do this, not on our account, but for the sake of your own advertising. We want to serve all advertisers equally well—but we can't put more hours into a day, and the advertiser who gives us the most time gets the best results.

Copy and cuts should be in our hands by Thursday of the week preceding the date of issue. This means that Thursday is the *last* day on which copy can be handled normally.

After that we cannot promise proofs, and we cannot insure classification.

For good advertising, get your cuts and copy in every week *before* Thursday.

Electric Railway Journal
239 West 39th Street, New York

Western Electric Company
INCORPORATED

supplies everything electrical and everything needed for the distribution and use of electricity, all of the best quality.

The Company has

32 Distributing Houses

for the convenience of its customers.

You will be interested in our

Tapes and Ajax Insulating Varnishes

Get prices from our nearest house

Western Electric Company
INCORPORATED

New York Atlanta Chicago Kansas City San Francisco
Buffalo Richmond Milwaukee St. Louis Oakland
Newark Savannah Indianapolis Dallas Los Angeles
Philadelphia New Orleans Detroit Houston Seattle
Boston Birmingham Cleveland Oklahoma City Portland
Pittsburgh Cincinnati Minneapolis St. Paul Omaha Denver Salt Lake City

EQUIPMENT FOR EVERY ELECTRICAL NEED
Member Society for Electrical Development. "Do it Electrically"

SEARCHLIGHT SECTION

FOR SALE

CARS

5—15 bench open cars with motors, trucks and air-brake equipment.
4—13 bench open cars with motors, trucks and air-brake equipment.
12—10 bench open cars with single trucks and motors.
4—20 ft. closed cars with single trucks and motors.

MOTORS

8—Brand new G.E. 201-H, 65 H.P. railway motors complete.
10—Brand new West. 306, 50 H.P. railway motors.
8—Brand new West. 317-A, 90 H.P. railway motors complete.

AIR COMPRESSORS

35—Second hand AA 1 air compressors.

CONTROLLERS

2—Brand new K-12 controllers.
12—K-6 controllers.

CABLE

10 miles S.H. 500,000 C.M. T.B. weather-proof concentric laid copper cable, weighing approximately 10,000 pounds to the mile.

For further particulars apply to

W. R. KERSCHNER COMPANY, INC.
50 Church Street, New York, N. Y.

IMMEDIATE SHIPMENT

Turbines

1—1250 KVA. Westinghouse Horizontal Turbo Generating Units, wound for 3 phase, 60 cycles, 2200 volts. Each unit complete with 4500 sq. ft. Worthington surface condenser, circulating pump, rotary dry vacuum pump and wet vacuum pump. Designed for 150 lb. steam pressure. Turbines fitted with bronze blading.

25 Cycle Rotary Converters

2—150 KW. General Electric type T.C., 4-150-750, 25 cycle, 3 ph., 575 volt, rotary converters, 750 rpm., complete with end play and speed limit device.

200 Kilowatt 60 Cycle Rotary Converters

2—200 KW. Westinghouse 3 ph., 60 cy. rotary converters, 550 volts, 720 rpm., complete with 4—100 KW. Westinghouse Scott connected oil insulated transformers, 10,000/9500 volts prim., 430/362 volts secy.

Transformers

6—750 KVA. General Electric oil filled self cooled transformers, 4400/281 volts, with 4400-4290-4180-4070-2200-2090-1980 taps in the primary.
3—500 KW. General Electric, 60 cy., single phase transformers, 66,000 volts primary, 4400/2200 volts secondary.
3—350 KVA. General Electric, type H, 60 cy., transformers 2400/2300/2200 v. prim., 200/400 v. secy.
1—100 KVA. General Electric, type H, 60 cy. transformer, 4600 volts prim., 115-230 volts secy.
3—100 KW. Wagner single phase, 60 cycle, 6600 volts primary, 2050/2300 volts secy., complete with oil.
4—100 KW. Westinghouse, oil insulated, Scott connected transformers, 10,000/9500 v. primary, 430/362 v. secondary.
3—75 KW. Westinghouse 60 cy. transformers, 2200 v. prim., 110/220/440 v. secy.
3—50 KVA. General Electric type H, 60 cy. transformers, 900/1000/16000 v. prim. Y., 230/460 v. secy.
Also a stock of smaller sized transformers.

IMMEDIATE DELIVERY

ARCHER & BALDWIN
114-118 Liberty Street New York City
TELEPHONE 4337-4338 RECTOR

STREET CAR MOTORS AND CONTROLLERS

MOTORS

10 Westinghouse No. 306. PRACTICALLY NEW—LESS THAN ONE YEAR IN SERVICE.
12 Westinghouse No. 317-A, with gears and pinions. ABSOLUTELY NEW.

CONTROLLERS

38 Gen. Elec. K-10 with handles and brackets.

RECIPROCATING UNITS—25 Cycle

1 1200 KW. Gen. Elec., 3 phase, 25 cycle, 6600 volts, 75 RPM., dir. conn. to 30" & 50" x 60" Allis cross compd. engine.
1 500 KW. Westg.
2 500 KW. Westg., 3 phase, 25 cycle, 390 volts, 215 RPM., dir. conn. to 22" & 36" x 21" Westg. steeple engines.
1 400 Kva. Crocker Wheeler, 3 phase, 25 cycle, dir. conn. to 24" x 36" Erie City side crank engine.

RECIPROCATING UNITS—550 Volt Direct Current

1 800 KW. Gen. Elec., 550 volt, 10 pole, dir. conn. to 36" x 48" E.P. Allis horiz. heavy duty engine, 100 RPM.
2 500 KW. Gen. Elec., 540-600 volt, 10 pole, dir. conn. to 32" x 48" Greene engines.

ROTARY CONVERTERS & MOTOR GENERATOR SETS, 25 Cycles

1 600 KW. Gen. Elec., TC-A, 3 ph., 600 volt D.C., 375 volt A.C., 8 pole, 375 RPM.
1 600 KW. set consisting of two 300 KW. 6 pole generators, 550 volts, 600 amps., dir. conn. to one 750 HP. synchronous motor, 3 ph., 25 cy., 6600 volt, 500 RPM., complete with AC and DC panels.
4 500 KW. Gen. Elec., HC-K, 600 volt D.C., 4 pole, 750 RPM., each rotary complete with three 165 Kva. Gen. Elec. OI SC Transformers, HP-RP, 6600/5940 volts prim., 430/286/143 volts sec., also necessary panels and instruments.
1 500 KW. Westg., 3 ph., 550 volt D.C., 390 volt A.C., 6 pole, 500 RPM., with dir. conn. starting motor, AC and DC panels and three 175 KW. Westg. oil cooled transformers, 13200 volts prim., 390 volts sec.

Our new and complete list of steam and electrical equipment will be mailed upon request

MACGOVERN & COMPANY, Inc.
114 Liberty Street, New York City

FOR SALE

Used Railway Power House Equipment, to be sold either all together or in part, consisting of—

3—Corliss Horizontal Cross Compound condensing engines, 30 x 60 x 60, 75 r.p.m., 150 lb., 3,000 h.p.

1—Corliss, ditto, 34 x 70 x 40—4,500 h.p.

4—Vertical Buckeye Engines, 6½x12—45 h.p.

20—PUMPS—Condenser, Circulating, Boiler-Feed, Air Compressor, etc.

16—B. & W. 400 h.p. Water Tube Boilers equipped with Mechanical Stokers—Acme.

2—Traveling Cranes—51 ft. span, 70,000 lbs.

3—Siemens & Halske 1500 K.W. 600 V. Generators, direct connected.

1—General Electric 1600 K.W. 600 V. Generator.

Apply to E. E. Kretschmer, Purchasing Agent

Northwestern Elevated Railroad Company
72 West Adams Street, Chicago, Ill.

SEARCHLIGHT SECTION

WANT TO BUY
3900 ft. 2/0 grooved

New Trolley Wire

State delivery and best price for the lot.
S. M. Gallaher, Supt.
CHARLESTON INTERURBAN RAILROAD CO.,
Charleston, W. Va.

CARS FOR SALE

OPEN and CLOSED
MOTOR and TRAIL
Write for Price and Full Particulars to
ELECTRIC EQUIPMENT CO.
Commonwealth Bldg. Philadelphia, Pa.

COMPLETE ARMATURES FOR SALE

FOR ALL THE STANDARD
STREET RAILWAY MOTORS
GET OUR PRICE WE CAN SAVE YOU MONEY
America's Greatest Repair Works
CLEVELAND ARMATURE WORKS, Cleveland, O.

THE SEARCHLIGHT SECTION

will find { The man / The position / The plant } *you want*

PUT YOUR AD IN THE SEARCHLIGHT

FOR SALE

Saw For Sale

No. 15 Lea Simplex cold metal saw, belt driven, diameter saw blade 15 in. Good condition. Must move quick. Will sell cheap. Commercial Truck Co. of America, Philadelphia, Pa.

FOR SALE

600 Flat Tie Rods

with ⅞" terminals and square nuts.

AUSTIN STREET RAILWAY CO.,
Austin, Texas.

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes.
Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Bldg. Pittsburgh, Pa.

Electrically Lighted Drafting Tables

Three specially constructed adjustable drafting tables with stools.

FOR SALE

Glass tops with electric lights placed in reflecting trough beneath the top.

Four different light intensities insure the proper light for any form of tracing.

Very heavy construction and just as good as new.

A Bargain to Quick Buyer

Address Office Manager
McGraw-Hill Publishing Co., Inc.
239 W. 39th St., New York

FOR SALE

Immediate Shipment

100 tons of 62 lb. Shanghai rails, together with bars, rails practically as good as new, ready for quick shipment. Wire for prices.

M. K. FRANK
Frick Building, Pittsburgh, Pa.

NEW STEEL RAILS
For Immediate Shipment
225 tons 75 lb. with Heavy Splices
280 tons 85 lb. with Angles
1000 tons 90 lb. with Angles

Exceptional opportunity. Also large quantity other Section. *Write or Wire.*

ZELNICKER IN ST. LOUIS

MISCELLANEOUS WANTS

Wanted at Once

For immediate shipment any quantity of battery lead plates, sediment scrap copper and wire, brass and all other grades of scrap material. Write to us today for our prices. National Metal & Rubber Co., 31 India Wharf, Boston, Mass.

POSITIONS WANTED

ENGINEER executive desires position as manager of public utility. Technical graduate, 15 years' experience; engineering, operating and executive positions. Good record and references. P. W. 1436, (Ill.) Elec. Ry. Jour., Chicago.

POSITIONS VACANT

Wanted first class

ARMATURE WINDERS

for A.C. and D.C. motors

Give reference and salary expected in first letter. Address

The Cameron Electrical Mfg. Co.,
Ansonia, Conn.

POSITIONS WANTED

HAVE had twelve years' experience in operating and traffic department of important electric railway systems. Am now superintendent of one. Best of references by present and past employers. Capable filling manager's position. P. W., 1513, (Ohio) Elec. Ry. Journal, Chicago.

STOREKEEPER, young married man, with several years' experience in store's department work, desires a change. Capable of taking full charge of store's department. Best of references. P. W., 1514 (Pa.), Elec. Ry. Journal, Philadelphia.

SUPERINTENDENT, good experience and record on city and suburban property. Available now. Good references. P. W. 1505 (Ill.) Elec. Ry. Journal, Chicago.

THOROUGH street railway man, understanding track, overhead line, motors, trucks and car wiring, 12 years superintendent on small road, open for position. What have you? D. F. T., 903 Swinton, Sault Ste. Marie, Mich.

POSITIONS VACANT

APPLICATIONS for positions as blacksmith, car carpenters, truck repairmen, motor repairmen, car electrician, armature winder, painters, pitmen wanted. No trouble. State age, qualifications, experience, salary wanted, references in first letter. A-1 men only need apply. Address P. 1484 (Ohio) Elec. Ry. Journal, Chicago.

DRAFTSMAN experienced in railway maintenance of way work and general designing. Apply Engineer, Maintenance of Way, N. O. T. & L. Co., Akron, Ohio.

TECHNICAL graduate as assistant in department having charge of schedules, 850 miles city and suburban lines, and special investigations. State experience in both and salary expected. P. 1509 (Mass.) Elec. Ry. Journal, N. Y. C.

EMPLOYMENT AGENCIES

Correspondence Service

The undersigned provides a confidential service designed to locate openings through correspondence for men earning not less than $2,500 and up to $25,000; all lines. Not an employment agency, but a constructive, initiative service, covering individual negotiations. Established 1910. Complete privacy assured; present connections in no way jeopardized. Send name and address only for explanatory details. R. W. Bixby, 111 Niagara Square, Buffalo, N. Y.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

More than 300 different products are here listed. The Alphabetical Index (see eighth page following) gives the page number of each advertisement.

As far as possible advertisements are so arranged that those relating to the same kind of equipment or apparatus will be found together.

This ready-reference index is up to date, changes being made each week.

If you don't find listed in these pages any product of which you desire the name of the maker, write or wire Electric Railway Journal, and we will probably furnish the information.

Acetylene Apparatus. (See Cutting Apparatus, Oxy-Acetylene.)

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Horne Mfg. Co.

Alloys and Bearing Metals. (See Bearings and Bearing Metals.)

Alloys, Steel and Iron.
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Ohio Brass Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Automobiles and Buses.
Brill Co., The J. G.

Axles.
National Tube Co.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The
Western Electric Co.

Bankers and Brokers.
National City Co.

Batteries, Dry.
Johns-Manville Co., H. W.
Western Electric Co.

Batteries, Storage.
Electric Storage Battery Co.
Western Electric Co.

Bearings and Bearing Metals.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
More-Jones Brass & M. Co.
St. Louis Car Co.
Westinghouse Elec. & M. Co.

Bearings, Center.
Baldwin Locomotive Works.
Holden & White, Inc.

Bearings, Roller and Ball.
Hess-Bright Mfg. Co.
Railway Roller Bearing Co.

Bearings, Roller Side.
Holden & White, Inc.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.
Western Electric Co.

Benders, Rail.
Niles-Bement-Pond Co.
Western Electric Co.
Zelnicker Sup. Co., W. A.

Blow Torches for Soldering and Brazing. (See Cutting Apparatus, Oxy-Acetylene.)

Blowers.
General Electric Co.
Westinghouse Elec. & M. Co.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Dearborn Chemical Co.
Johns-Manville Co., H. W.

Boiler Coverings.
Johns-Manville Co., H. W.

Boiler Tubes.
National Tube Co.

Bond Clips.
Electric Railway Improvement Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improvement Co.
Ohio Brass Co.

Bonding Tools.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Electric Railway.
Railway Bonding Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Bonds, Welded.
Lincoln Bonding Co.

Book Publishers.
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Etc.)
American Bridge Co.
Bates Expanded Steel Truss Co.
Electric Service Supplies Co.
Hubbard & Co.
Int'l Creosoting & Constr. Co.
Lindsley Bros. Co.
Ohio Brass Co.
Western Electric Co.

Brake Adjusters.
Holden & White, Inc.
Smith-Ward Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdy. Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Long Co., E. G.
St. Louis Car Co.

Brakes, Brake Systems and Brake Parts.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Westinghouse Trac. B. Co.

Bridges and Buildings.
American Bridge Co.

Brooms, Track, Steel or Rattan.
Paxson Co., J. W.
Western Electric Co.
Zelnicker Supply Co., W. A.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.

Brushes, Carbon.
American Carbon & Battery Co.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
Dixon Crucible Co., Jos.

Bumpers, Car Seat.
Electric Service Supplies Co.

Bunkers, Coal.
American Bridge Co.

Bushings, Case Hardened and Manganese.
Bemis Car Truck Co.

Bushings, Fibre.
Diamond State Fibre Co.

Buttons. (See Badges and Buttons.)

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc. —See those headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Jewett Car Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Stephenson Co., John.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co.
Kerschner Co., Inc., W. R.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Car Stops, Automatic.
Consolidated Car-Heating Co.

Castings, Brass.
Columbia M. W. & M. I. Co.
Eureka Co.
Frankel Connector Co.
More-Jones Brass & M. Co.

Castings, Composition or Copper.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.

Castings, Gray Iron and Steel.
Amer. Brake Shoe & Fdy. Co.
American Bridge Co.
American Steel Foundries.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
Amer. Brake Shoe & Fdy. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Eclipse Railway Supply Co.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
Ohio Brass Co.
Union Electric Co.
Wood Co., Chas. N.

Ceiling, Car.—(See head lining.)

Charging Sets, Storage Battery.
General Electric Co.

Chemists.
Little, Inc., Arthur D.

Circuit Breakers.
Cutter Electrical & Mfg. Co.
General Electric Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
Frankel Connector Co.
General Electric Co.
Hubbard & Co.
Klein & Sons, Mathias.
Ohio Brass Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Cleaners and Scrapers, Track. —(See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.
Van Dorn & Dutton Co.
Western Electric Co.

Cleats, Car Wiring.
General Electric Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling.—(See Conveying and Hoisting Machinery.)

Coasting Clocks.
Railway Improvement Co.

Coil Banding and Winding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Western Electric Co.

Coils, Armature & Field.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Standing the Overload

What's the usual result of an overload on your car motors or compressors?

A puff of smoke—followed by a trip to the repair shop. You can eliminate these trips by using

Salamander Fireproof Wire

motor field, armature and compressor coils. You can't burn out Salamander Wire Coils. We've had them red-hot on test without any breakdown.

Send for samples and catalogs.

Independent Lamp & Wire Co., Inc.

Offices: 1737 Broadway, New York
FACTORIES: York, Pa., and Weehawken, N. J.

TULC

MANY SYSTEMS ARE USING TULC after first making most thorough tests under all conditions. Such tests have shown that it will cut lubrication costs in half.

THE UNIVERSAL LUBRICATING CO.
Schofield Building CLEVELAND, O.

"Boyerized" Products Reduce Maintenance

- Bemis Trucks
- Case Hardened Brake Pins.
- Case Hardened Bushings
- Case Hardened Nuts and Bolts
- Manganese Brake Heads
- Manganese Transom Plates
- Manganese Body Bushings
- Bronze Axle Bearings

Bemis Pins are absolutely smooth and true in diameter. We carry 40 different sizes of case hardened pins in stock. Samples furnished. Write for full data.

Bemis Car Truck Co., Springfield, Mass.

IT IS A PAYING INVESTMENT

to carry an advertisement in the ELECTRIC RAILWAY JOURNAL every week in the year.

THE P. EDW. WISCH SERVICE
DETECTIVES

Suite 1710
Park Row Bldg., New York

Suite 715
Board of Trade Bldg., Boston

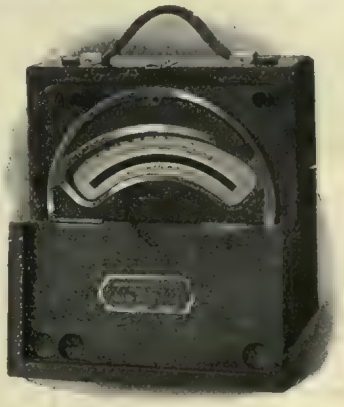
For General Testing

in Electric Power Plants, or for Outdoor Work

Weston

Model 45

D. C. Portable Ammeters and Voltmeters



Designed to meet the demand for a medium-priced Ammeter and Voltmeter. Their accuracy is guaranteed within 1 per cent.

They are shielded from the influence of external magnetic fields, the movement and magnetic system being enclosed in an iron case permanently mounted in a handsome wooden carrying-box with hinged cover.

The scale has a mirror over which the knife-edge pointer travels. Readings can be made within 1/10 of a division at any part of the scale.

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Union Spring & Mfg. Co.

Sprinklers, Track & Road.
Brill Co., The J. G.
St. Louis Car Co.

Steps, Car.
American Mason S. T. Co.
Universal Safety Tread Co.

Stokers, Mechanical.
Babcock & Wilcox Co.
Green Engrg. Co.
Murphy Iron Works.
Westinghouse Elec. & M. Co.

Storage Batteries. (See Batteries, Storage.)

Straps, Car, Sanitary.
Holden & White, Inc.
Railway Improvement Co.

Structural Iron. (See Bridges.)

Superheaters.
Babcock & Wilcox Co.
Power Specialty Co.

Sweepers, Snow. (See Snow Plows, Sweepers & Brooms.)

Switch Stands.
Kilby Frog & Switch Co.
Ramapo Iron Works.

Switches, Automatic.
Western Electric Co.

Switches, Track. (See Track, Special Work.)

Switchboard Mats.
Western Electric Co.

Switches & Switchboards.
Anderson Mfg. Co., A. & J. M.
Cutter Electrical & Mfg. Co.
Electric Service Supplies Co.
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Westinghouse Elec. & M. Co.

Tampers, Tie.
Ingersoll-Rand Co.

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Electric Service Supplies Co.
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Frankel Connector Co.

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Elec'l Testing Laboratories.
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Testing Instruments. (See Instruments, Electrical Measuring, Testing, etc.)

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Consolidated Car-Heating Co.
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Ticket Choppers & Destroyers.
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Ties, Wood Cross. (See Poles, Ties, Posts, etc.)

Tools, Track & Miscellaneous.
American Steel & Wire Co.
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Electric Service Supplies Co.
Hubbard & Co.
Johns-Manville Co., H. W.
Klein & Sons, Mathias.
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Torches, Acetylene. (See Cutting Apparatus.)

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American Bridge Co.
Archbold-Brady Co.
Bates Exp. Steel Truss Co.
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McCardell & Co., J. R.

Track, Special Work.
Cleveland Frog & Cross. Co.
Columbia M. W. & M. I. Co.
Kilby Frog & Switch Co.
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Transfers. (See Tickets.)

Transfer Tables.
American Bridge Co.
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General Electric Co.
Packard Electric Co.
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Westinghouse Elec. & M. Co.

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American Mason S. T. Co.
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Anderson Mfg. Co., A. & J. M.
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Trolleys & Trolley Systems.
Ford Chain Block & Mfg. Co.

Trolley Shoes.
Holden & White, Inc.

Trolley Wheels. (See Wheels, Trolley.)

Trucks, Car.
American Steel Foundries.
Baldwin Locomotive Works.
Bemis Car Truck Co.
Brill Co., The J. G.
Long Co., E. G.
St. Louis Car Co.

Tubing, Steel.
National Tube Co.

Turbines, Steam.
General Electric Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Turnstiles.
Perey Mfg. Co., Inc.

Union Couplings.
National Tube Co.

Valves.
National Tube Co.
Ohio Brass Co.

Varnishes. (See Paints, etc.)

Ventilators, Car.
Brill Co., The J. G.
Globe Ventilator Co.
Holden & White, Inc.
Railway Utility Co.
St. Louis Car Co.

Vestibules, Portable.
Brill Co., The J. G.

Voltmeters. (See Instruments.)

Washers.
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Wheel Guards. (See Fenders & Wheel Guards.)

Wheel Presses. (See Machine Tools.)

Wheels, Car, Cast Iron.
Bemis Car Truck Co.
Griffin Wheel Co.
Long Co., E. G.

Wheels, Car, Steel and Steel Tired.
American Steel Foundries.
Bemis Car Truck Co.
Carnegie Steel Co.
Standard Steel Works Co.

Wheels, Trolley.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Eureka Co.
General Electric Co.
Hensley Trolley & Mfg. Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Long Co., E. G.
More-Jones Brass & M. Co.
Nuttall Co., R. D.
Star Brass Works.

Whistles, Air.
General Electric Co.
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Winding Machines. (See Coil Banding and Winding Machines.)

Wire Rope.
American Steel & Wire Co.
Roebling's Sons Co., John A.

Wires and Cables.
Aluminum Co. of America.
American Steel & Wire Co.
Bridgeport Brass Co.
D & W Fuse Co.
General Electric Co.
Packard Electric Co.
Page Woven Wire Fence Co.
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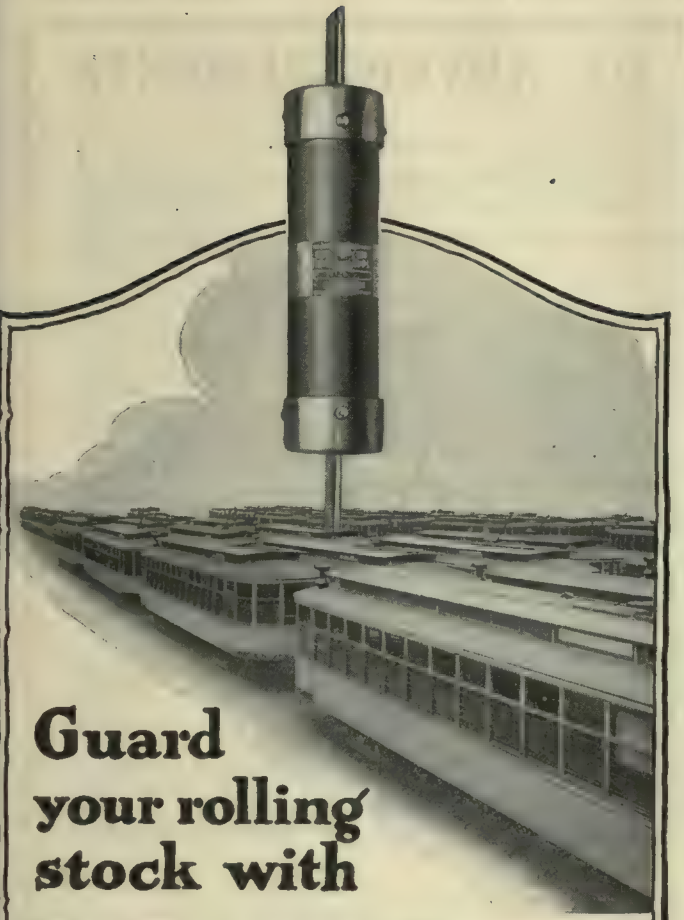

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If proofs before printing are required, change of copy and copy for new advertisements must be in our hands 10 days in advance of the date of publication.

A

Page
Aluminum Co. of America...... 41
Amer. Brake Shoe & Fdry. Co.. 48
American Bridge Co. 33
American Car Co............... 63
American Carbon & Battery Co.. 55
American Mason S. T. Co...... 48
American Rolling Mill Co...... 15
American Steel Foundries 27
American Steel & Wire Co..... 43
Anderson Mfg. Co., A. & J. M.. 41
Archbold-Brady Co. 42
Archer & Baldwin, Inc.......... 50
Arnold Co., The............... 32

B

Babcock & Wilcox Co.......... 44
Baker, Wm. M................. 15
Baldwin Locomotive Works, The 48
Bark River Bridge & Cul. Co... 15
Barrett Co., The.............. 57
Bates Expanded Steel Truss Co. 41
Bemis Car Truck Co............ 53
Bonham Recorder Co........... 21
Bonney-Vehslage Tool Co....... 46
Bridgeport Brass Co........... 10
Brill Co., The J. G............ 63
Buckeye Jack Mfg. Co......... 45
Burch, Edw. P................. 32
Byllesby & Co., H. M.......... 32

C

California Cor. Culvert Co...... 15
Canada Ingot & Iron Co., Ltd... 15
Canton Culvert & Silo Co...... 43
Carnegie Steel Co............. 38
Carney & Co., B. J............. 42
Chipman Chemical Engrg. Co.... 33
Cleveland Armature Works..... 51
Cleveland Frog & Crossing Co.. 43
Coast Cul. & Flume Co........ 15
Collier, Inc., Barron G......... 8
Columbia M. W. & M. I. Co..... 34
Consolidated Car Fender Co.... 24
Consolidated Car-Heating Co.... 46
Cooper Heater Co., The........ 46
Corrugated Culvert Co......... 15
Cutter Co. 45

D

D & W Fuse Co................ 45
Daum, A. F................... 46
Dayton Fare Recorder Co....... 20
Dearborn Chemical Co.......... 44
Delaware Metal Culvert Co..... 15
Diamond State Fibre Co........ 42
Dixie Culvert & Metal Co...... 15
Dixon Crucible Co., Joseph..... 44
Duff Manufacturing Co., The.... 37

E

Eclipse Ry. Supply Co.......... 48
Electric Equipment Co......... 51
Electric Railway Improve. Co.... 16
Electric Railway Journal........ 36
Electric Service Supplies Co.... 11
Electric Storage Battery Co..... 55
Elec'l Testing Laboratories...... 32

Page
Ellcon Co. 39
Eureka Co. 46

F

Federal Signal Co.............. 41
Ford, Bacon & Davis........... 32
Ford Chain Block & Mfg. Co... 45
"For Sale" Ads.............50, 51
Frankel Connector Co.......... 41

G

General Electric Co..30, Back Cover
Globe Ventilator Co............ 47
Gold Car Heating & Lighting Co. 46
Green Eng'g Co................ 44
Griffin Wheel Co.............. 38

H

Hale & Kilburn Co............. 22
Hardesty Mfg. Co., R.......... 15
Hartshorn Co., Stewart......... 46
"Help Wanted" Ads.........50, 51
Hensley Trolley & Mfg. Co..... 46
Hess-Bright Mfg. Co........... 25
Holden & White, Inc........... 47
Horne Mfg. Co................ 55
Hubbard & Co................. 42
Hunt & Co., Robert W.......... 32

I

Illinois Cor. Metal Co.......... 15
Independence Culvert Co....... 15
Independent Lamp & Wire Co.. 53
Ingersoll-Rand Co. 55
International Creo. & Con. Co.. 42
International Register Co., The.. 46
International Steel Tie Co., The. 9
Iowa Pure Iron Culvert Co..... 15

J

Jackson, D. C. & Wm. B....... 32
Jeandron, W. J................ 55
Jewett Car Co................. 40
Johns-Manville Co., H. W...... 59

K

Kentucky Culvert Co........... 15
Kerschner Co., Inc., W. R...... 50
Kilby Frog & Switch Co....... 44
Kinnear Mfg. Co.............. 45
Klein & Sons, Mathias......... 42
Kuhlman Car Co., G. C........ 63

L

Lee-Arnett Co. 15
Lincoln Bonding Co............ 12

Page
Lincoln Electric Co............ 18
Lindsley Bros. Co.............. 42
Little, Inc., Arthur D......... 32
Lone Star Cul. Co............. 15
Long Co., E. G................ 48
Lyle Cor. Culvert Co........... 15

M

McCardell & Co., J. R......... 42
McGraw-Hill Book Co., Inc..... 28
MacGovern & Co., Inc......... 50
Marsh & McLennan............ 42
Michigan Bridge & Pipe Co..... 15
Montana Culvert & Flume Co... 15
More-Jones Brass & Metal Co... 26
Morgan Crucible Co........... 59
Murphy Iron Works........... 45

N

Nachod Signal Co.............. 41
National Brake Co. 31
National City Co. 32
National Pneumatic Co......... 19
National Railway Appliance Co.. 53
National Tube Co. 42
Nebraska Culvert & Mfg. Co.... 15
Nelsonville Brick Co........... 14
Nevada Metal Mfg. Co......... 15
New England Metal Cul. Co.... 15
New York Switch & Cross. Co.. 43
Niles-Bement-Pond Co. 45
North-East Metal Culvert Co.... 15
Northwestern Sheet & Iron Wks. 15
Nuttall Co., R. D.............. 47

O

Ohio Brass Co.................6, 7
Ohio Cor. Cul. Co., The........ 15
O'Neall Co., W. Q............. 15

P

Packard Electric Co............ 45
Page & Hill Co................ 42
Page Woven Wire Fence Co.... 42
Pantasote Co., The............ 35
Patten Co., Paul B............. 47
Paxson Co., J. W.............. 43
Pennsylvania Metal Cul. Co.... 15
Perey Mfg. Co., Inc............ 47
"Positions Wanted" Ads........ 51
Power Specialty Co............ 45
Publisher's Page 36

R

Rail Joint Co.................. 43
Railway Bonding Co............ 32
Railway Improvement Co.....17, 29
Railway Roller Bearing Co...... 62
Railway Track-work Co........ 13
Railway Utility Co............. 47
Ramapo Iron Works............ 44

Page
Richey, Albert S............... 32
Road Supply & Metal Co....... 15
Roebling's Sons Co., John A.... 42
Rooke Automatic Register Co... 46

S

St. Louis Car Company, The.... 48
Samson Cordage Works.Front Cover
Sanderson & Porter............ 32
Sangamo Electric Co........... 23
Scaife & Sons Co., Wm. B..... 45
Scofield Engineering Co........ 32
Searchlight Section 50, 51
Second Hand Equip.........50, 51
Simmen Automatic Railway Signal Co. 41
Sioux Falls Metal Cul. Co...... 15
Smith Heater Co., Peter........ 46
Smith-Ward Brake Co......... 55
Spokane Cor. Cul. & Tank Co... 15
Standard Steel Works Co...... 39
Standard Woven Fabric Co..... 45
Star Brass Works............. 47
Stephenson Co., John.......... 63
Stephenson Sons & Co., S....... 32
Stone & Webster Eng'g Corp.... 32

T

Tennessee Metal Cul. Co........ 15
Titanium Alloy Mfg. Co......... 61

U

Union Spring & Mfg. Co........ 55
Universal Lubricating Co., The.. 53
Universal Safety Tread Co..... 48
Utah Cor. Cul. & Flume Co..... 15

V

Valentine-Clark Co., The....... 42
Van Dorn Coupler Co.......... 48
Van Dorn & Dutton Co., The... 47
Virginia Metal Cul. Co......... 15

W

"Want" Ads 51
Wason Mfg. Co............... 63
Western Electric Co........... 49
Western Metal Mfg. Co........ 15
Westinghouse Elec. & Mfg. Co..2, 5
Westinghouse Traction Brake Co. 4
Weston Elec'l Instrument Co... 53
White Companies, The J. G..... 32
Wisch Service, The P. Edw..... 53
Wood Co., Chas. N............ 41
Woodmansee & Davidson, Inc... 32
Wyatt Metal Works........... 15

Z

Zelnicker Supply Co., Walter A. 51

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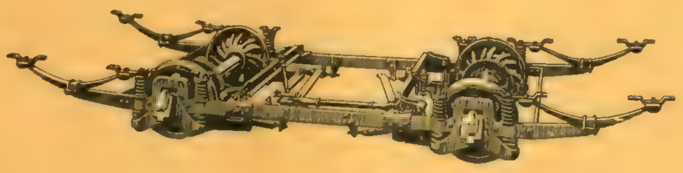

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ELECTRIC RAILWAY JOURNAL

New York, June 2, 1917 McGraw-Hill Publishing Co., Inc. Vol. 49, No. 22 10c a copy

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ELECTRIC RAILWAY JOURNAL

VOLUME XLIX, No. 22 NEW YORK, JUNE 2, 1917 PAGES 989 TO 1034

CONTENTS

Putting Across the Skip Stop in Baltimore

Dwight Burroughs tells how the United Railways & Electric Company after thorough preparation has sold the skip-stop plan to some of its patrons on the basis of time-saving. Reasoning men appreciate its advantages when properly explained..........................Page 992

New Kansas Interurban Line Serves Central States

The Arkansas Valley Interurban Railway, connecting the cities of Wichita, Hutchinson and Newton, forms the central section of a contemplated extensive system of electric railway lines ....Page 996

Springfield Street Railway Wants 6-Cent Fare

Need of Massachusetts company explained by President Wood at board of trade meeting. Professor Richey in special report states that revenues must be increased in some way.......................Page 1000

EQUIPMENT AND ITS MAINTENANCE....1011

Track Construction in Des Moines—*By W. L. Wilson.*
Galvanized-Iron Wire for High-Tension Lines.
Boards for Equipment Standards.
Inexpensive Apparatus for Registering Power House Vibration—*By S. R. Jones.*
Effect of Laying Tracks to Follow Crown of Street—*By D. P. Falconer.*
Two Ways of Reinforcing Corroded Iron Poles at the Ground Line in Richmond.
A Universal Bearing Chuck.
Two Portable Cross-Overs and Temporary Track Around Corner Make Car Detour Possible.
Neat Layout of Fireproof Car Control Cabinet.
Conductor's Folding Seat.
Marking Spare Axles to Save Time.
Guard for Use in Replacing Broken Water Gage Glasses.
Method for Removing Tight Wheels.

EDITORIALS 989

Publicity and the Skip Stop.
Government Ownership is Not a Solution.
Make it a 100-Per Cent Campaign.
Popular Bond Subscriptions Are Necessary.
Effect of the Conscription Act.
The 6-Cent Fare Must Come.
Commission and Utilities Organize for National Defense.
We Must Stop Wasting Coal.

COASTING RECORDERS AT FORT WORTH...995

FARE CASE TO BE REOPENED............998

PUBLIC OWNERSHIP DISCUSSED.........1003

NEW YORK CITY HEARINGS TO START ON JUNE 6 1003

WORKING TO PREVENT AUTOMOBILE ACCIDENTS 1004

EDITORS HEAR DEPARTMENT HEADS......1005

ELECTRIC RAILWAYS CO-OPERATE WITH WAR DEPARTMENT 1008

COMMUNICATION 1009

What Causes Double Wheel Tread?

AMERICAN ASSOCIATION NEWS..........1009

LONDON LETTER 1017

NEWS OF ELECTRIC RAILWAYS..........1018

Boston Elevated Obtains Partial Relief.
Short Municipal Elevated Suggested.
Salt Lake Labor Questions Settled.
South Bend Mediation Fails.
Hearing on Philadelphia Bills.
Illinois Storm Damage.

FINANCIAL AND CORPORATE............1022

Merger of New Jersey Companies.
Reduction in Light and Power Rates.
"No Par Value" Bill Signed.
Bonds to Purchase Street Railway.

TRAFFIC AND TRANSPORTATION.........1025

Copper-Zone System to Be Tried.
Decisions on Free-Ride Law.
Ten-Cent Fare Proposed.
Changes Proposed for Buffalo.
California Jitneys Ask Increase.
Portland Wants Jitney Regulation.

LEGAL NOTES 1027

PERSONAL MENTION 1028

CONSTRUCTION NEWS 1029

MANUFACTURES AND MARKETS 1031

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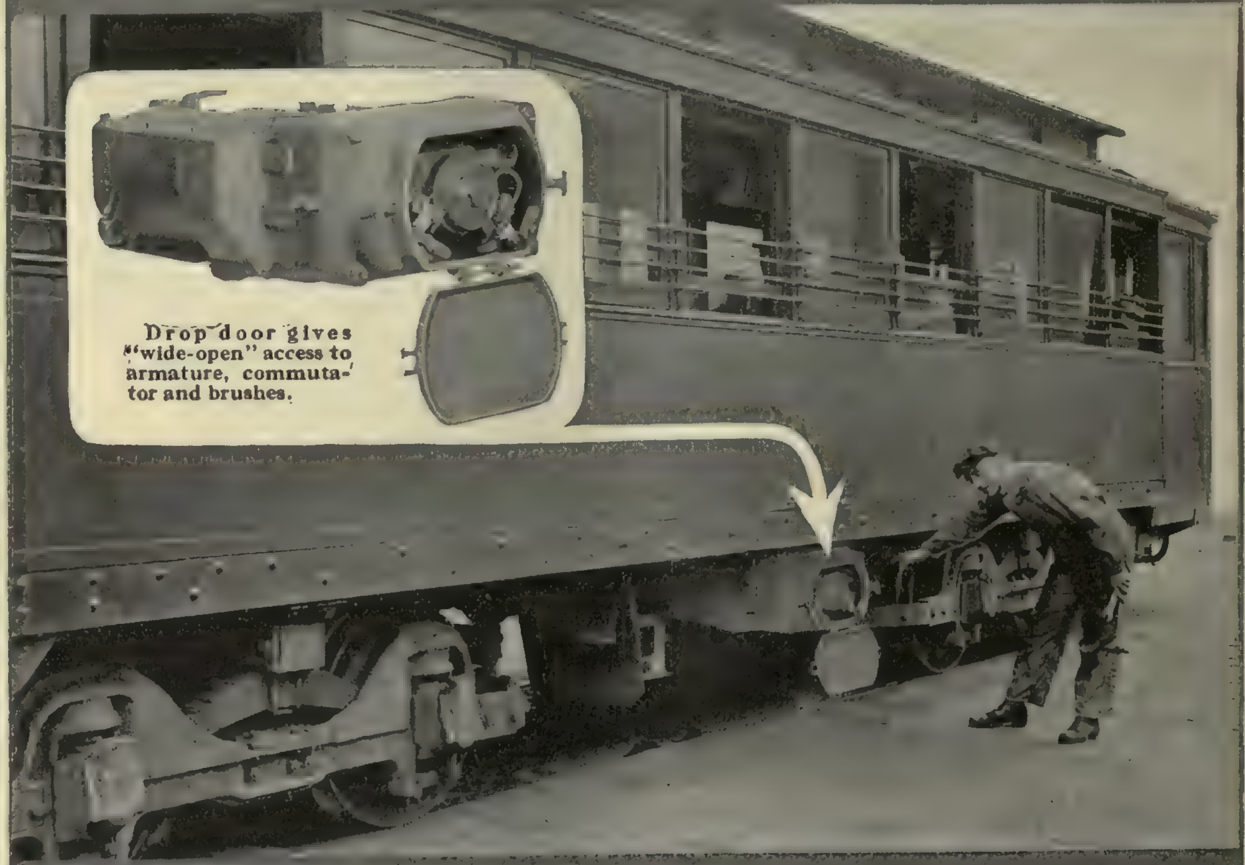

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Our air brake and safety control can be readily applied to any type of car in city service and our engineers will be glad to figure with you. Write us.

Safety Car Devices Co.

Main Office, Boatmen's Bank Bldg.

ST. LOUIS, MO.

CHICAGO
Ry. Exch. Bldg.

NEW YORK
City Invest. Bldg.

PITTSBURGH
Westinghouse Bldg.

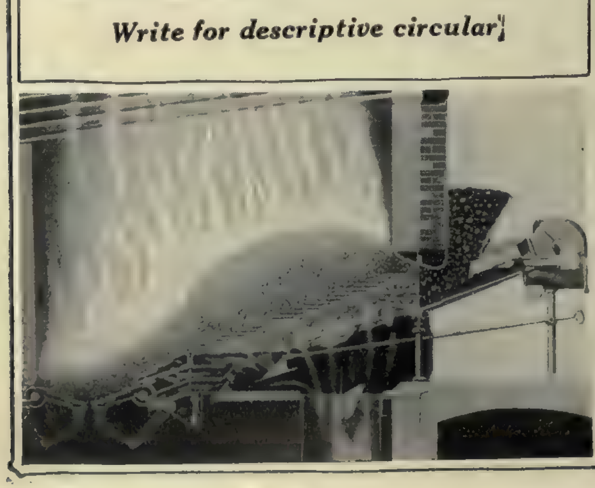
Westinghouse

Underfeed Stoker

This list of Westinghouse Underfeed Stokers installed and on order was prepared to show their wide distribution throughout the United States:

Purchaser	Number of Units	Total Boiler H.P.
Duquesne Light Co., Pittsburgh, Pa	8	4800
City of Detroit, Michigan	2	1370
Consumers Power Co., St. Paul, Minn	4	2000
Firestone Tire & Rubber Co., Akron, O	2	1750
" " (Repeat Order)	2	1750
Norfolk & Western R. R. Co., Bluestone, W. Va.	10	6670
" " (Repeat Order)	2	1334
Public Service Elec. Co., Jersey City, N. J	5	3000
" " (Repeat Order)	5	3250
Roanoke Railway & Electric Co., Roanoke, Va	4	2100
" " (Repeat Order)	2	1000
Spang-Chalfant Co., Pittsburgh, Pa	2	1000
" " (Repeat Order)	1	For Heating Furnace
" " (Repeat Order)	1	" " "
United Gas & Elec. Engr. Corp., New Orleans, La.	1	900
" " (Repeat Order)	2	1800
" " (Repeat Order)	5	4500
U. S. Navy Yards, Brooklyn, N. Y	12	5120
U. S. Proving Grounds, Indian Head, Md	8	3812
West Penn Traction Co., Connellsville, Pa	3	3900
Minneapolis General Elec. Co., (H. M. Byllesby & Co.), Minneapolis, Minn.	12	7200
" " (Repeat Order)	5	6310
Cluett-Peabody & Co., Troy, N. Y	2	1000
" " (Repeat Order)	2	1000
American Gas & Elec. Co., Windsor, W. Va	5	6310
" " (Repeat Order)	3	3786
" " (Repeat Order)	4	5048
" " (Repeat Order)	4	5048
Harrison Bros. & Co., Philadelphia, Pa	5	2500
Western Lt. & Power Co., Lafayette, Colo	1	411
" " (Repeat Order), Cheyenne, Wyo	2	911
" " (Repeat Order), Lafayette, Colo	4	1644
Transit Supply Co., Minneapolis, Minn	1	550
" " (Repeat Order)	11	6050
Interstate Lt. & Pwr. Co. (H. M. Byllesby & Co.), Galena, Ill	2	820
" " (Repeat Order)	4	1640
" " (Repeat Order)	2	820
Arkansas Valley Ry., Lt. & Pr. Co. (H. M. Byllesby & Co.), Canon City, Colo	3	1800
Union Elec. Lt. & Pr. Co., St. Louis, Mo	10	5580
" " (Repeat Order)	6	3348
Merchants Heat & Lt. Co., Indianapolis, Ind	8	4000
" " (Repeat Order)	2	2000
Alabama Power Co., Birmingham, Ala	5	6000
Edison Electric Illum. Co., Boston, Mass	8	4096
" " (Repeat Order)	6	3348
Union Gas & Elec. Co., Cincinnati, O	8	10096
Duluth & Iron Range R. R. Co., Two Harbors, Minn	4	1000
Little Rock Ry. & Elec. Co. (United Gas & Elec. Engr. Corp.), Little Rock, Ark	2	1200

Write for descriptive circular

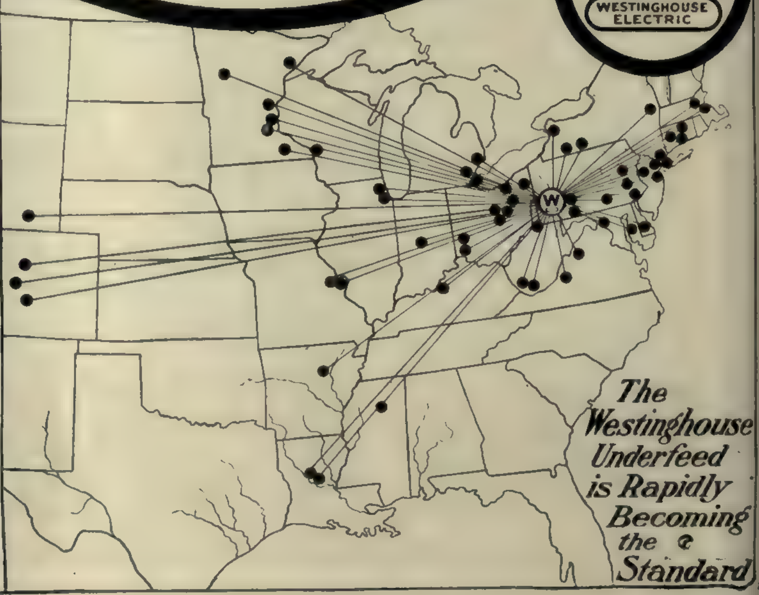


Wonderful Reserve Power

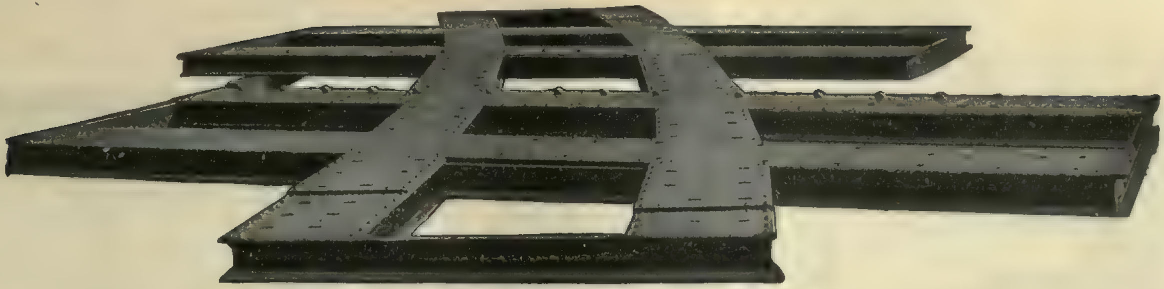
—NO waste—NO idle equipment —NO banked fires—NO spare boilers to be held in readiness for the daily peaks. For the Westinghouse Underfeed Stoker embodies IN ITS DESIGN a wonderful flexibility—a gigantic overload capacity.

Westinghouse Electric & Manufacturing Co.,
East Pittsburgh, Pa.

The Choice of a Stoker Always Narrows Down to a Study of Plant Requirements



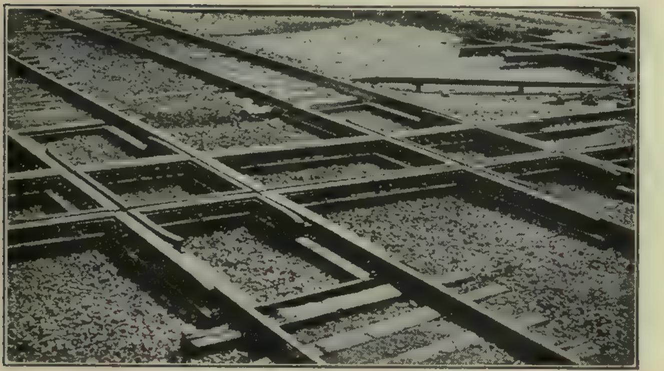
The Westinghouse Underfeed is Rapidly Becoming the Standard



INTERNATIONAL
STEEL CROSSING FOUNDATIONS
distribute the impact uniformly

Every inch of the rail is supported and the load is uniformly distributed over a large ballast area.

The joints are supported, making them as strong as any other part of the crossing frog.



WOOD-BLOCK FILLED CROSSING, WELLINGTON, OHIO

Broken bolts are practically eliminated because the frog is held to line and surface.

The installation is simple and they insure protection to your crossing frog investment.

The method of fastening frogs to the foundation is absolutely beyond criticism and is the result of our experience with several hundred installations. They prevent rail creeping.

International Steel Crossing Foundations will cut your maintenance costs.

Let us give you the figures.

Prompt deliveries made from stock.

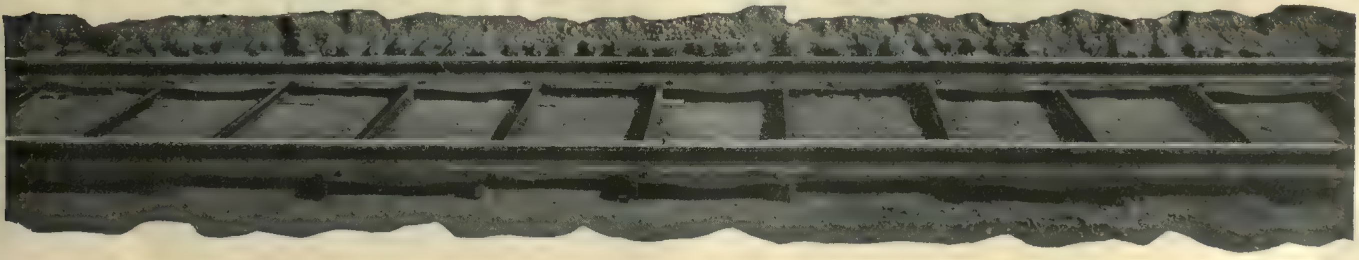
The International Steel Tie Company

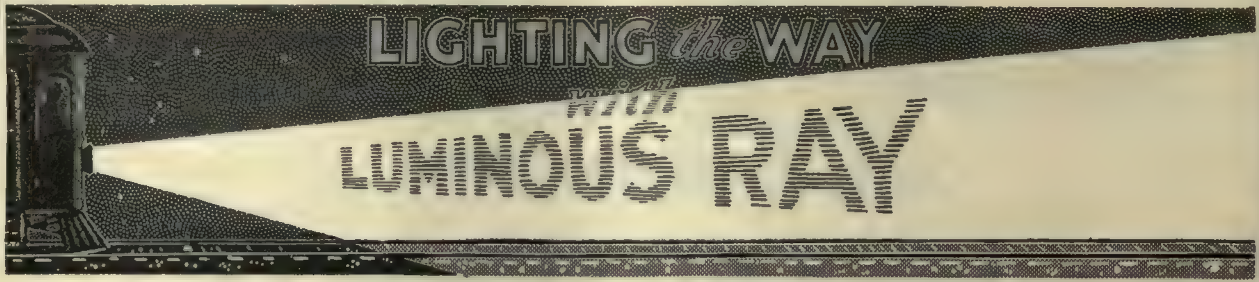
Manufacturers of Steel Twin Ties and Crossing Foundations

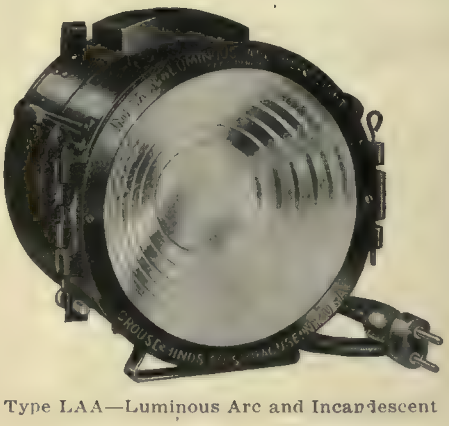
General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co., Los Angeles, Cal.	San Francisco, Cal. Seattle, Wash.	R. J. Cooper Co., Salt Lake City, Utah.	J. E. Lewis & Co., Dallas, Texas.	Maurice Joy, Philadelphia.	William H. Ziegler, Minneapolis, Minn.







Type LAA—Luminous Arc and Incandescent

On interurban roads where the voltage fluctuates, but where a strong, far-reaching, dependable light is indispensable to safety—there Crouse-Hinds Imperial Luminous Arc Headlights should be used.

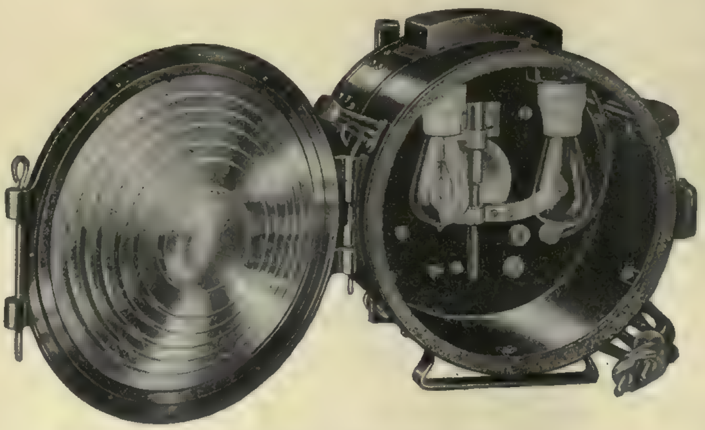
Even when the voltage drops far below normal they project a penetrating powerful beam.

And careful attention to detail of design has made

Imperial Luminous Arcs

simple, trouble-proof, reliable.

For an instance take the two compartment case—



Type LAA—Front door open

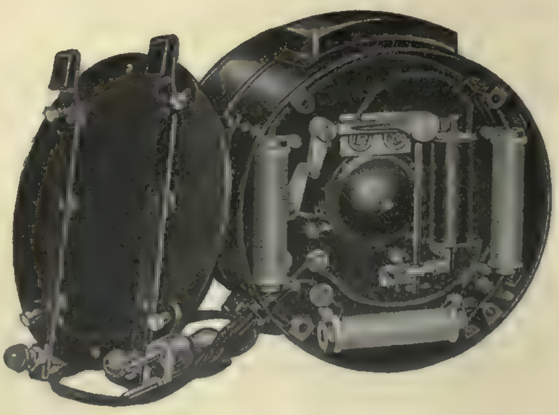
All the mechanism is mounted on the back of a partition which forms an airtight seal between the front and back.

Thus the fumes and deposits given off by the arc are dissipated through ventilation and cannot deposit on the working parts.

Consequently there is the reliability of operation which means safety and the minimum of maintenance which means economy.

Engineers thoroughly familiar with operating requirements will assist you in choosing the right type of Headlight for your cars. Remember the Imperial line includes

Luminous Arcs, Carbon Arcs and Incandescents



Type LAA—Rear door open

The Ohio Brass Co.

Mansfield, Ohio

General Sales Agents in U. S. for
Crouse-Hinds Imperial Headlights

O-B Engineering Service on Catenary Construction

Many problems arise in the construction of a catenary system. On different roads, under different conditions, different solutions have been found.

O-B Engineers have been in close touch with many installations throughout this country and Canada. Frequently they have evolved new devices to meet special requirements. Naturally they have gained a fund of knowledge which is invaluable.

O-B Catenary Materials are serving well on scores of roads. Their satisfactory records are eloquent.

But even if you do not expect to use O-B Materials you are welcome to the assistance of O-B Engineers.

The Ohio Brass Co.
Mansfield, Ohio

In the front part of catalog No. 16 are pictures of a few O-B Catenary Installations with short descriptions.

Phono-Electric

At Tacoma—Because it Outwears Ordinary Wire

Pacific Ave.
Tacoma, Wash.

The Tacoma Railway & Power Company, Tacoma, Wash., is installing Phono-Electric on all curves and turn-outs and in all districts where traffic is heavy. This Company is already using it on Pacific Avenue, one of the most important streets of the city.

Have you ever figured how much you could save by installing Phono-Electric Trolley Wire on **your** lines; how it means less overhead expense, less traffic interruption, more fares and better public relations?

Join forces with Phono-Electric.

Bridgeport Brass Company, Bridgeport, Conn.

The Lehigh Valley Transit Co. are firm believers in good Trolley Catchers and good Lighting Fixtures

Keystone Trolley Catchers

They use Keystone Catchers because they are rugged, foolproof and will not allow rebounding. And because they unfailingly catch the pole

"Safety" Car Lighting Fixtures

They use "Safety" Fixtures because they make possible efficient car lighting, which adds greatly to the comfort of passengers and offers them another inducement to ride

CARNEGIE LIBRARY HOUSTON, TEXAS

A two-car Limited Train of the Lehigh Valley Transit Co.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

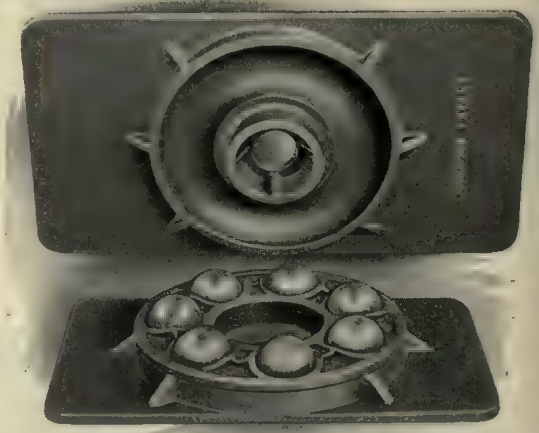
Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto

These Roads Are Reducing Flange Wear on Old Cars by Installing

Perry-Hartman Bearings

These bearings practically double the life of wheels, cut in half pull-ins for wheel renewals, decrease nosing, lessen flange and rail wear, reduce power consumption on curves, eliminate lubrication costs. The following roads are using them on both old and new cars and repeat orders testify as to service. Over 200,000 are in daily service. These railways know the results—

Aurora, Elgin & Chicago R.R.
Beaver Valley Traction Co.
Binghamton Railway Company
Buffalo & Lake Erie Traction Co.
Calgary Railway
Carolina Power & Light Company
Cedar Rapids & Marion City Ry. Co.
Chambersburg, Greencastle & Waynesboro Street Ry. Co.
Chicago Elevated Railways
Chicago, South Bend & Northern Indiana Ry. Co.
Chicago & West Towns Railway Company
Cleveland & Eastern Traction Company
Cleveland & Erie Railway Company
Cleveland, Painesville & Eastern R.R. Co.
Colorado Springs & Interurban Railway Company
Denver Tramways Company
Des Moines City Railway Company
East St. Louis & Suburban Railway Company
Evanston Railway Company
Evansville Railways Company
Evansville Public Utilities Company
Fonda, Johnstown & Gloversville R.R.
Ft. Wayne & Northern Indiana Traction Co.
Ft. Wayne & Northwestern Railway Company
Gary & Interurban R. R. Company
Harrisburg Railways Company
Houghton County Traction Company
Lake Shore Electric Railway Company
Lehigh Valley Transit Company
Louisville Railway Company
Lowell & Fitchburg Street Railway Company
Mahoning & Shenango Railway & Light Co.
Maryland Electric Railways Company
Mason City & Clear Lake R. R. Company
Michigan Railway Company
Newport News & Hampton Ry., Gas & Elec. Co.
New York, Westchester & Boston Ry. Company
Northern Texas Traction Company
Oakland, Antioch & Eastern Railway
Ogden, Logan & Idaho Railway Company
Oklahoma Railway Company
Philadelphia Rapid Transit Company
Salt Lake & Utah R. R. Company
Schenectady Railway Company
Scranton Railway Company
Southern Traction Company
Union Traction Company of Indiana
Waterloo, Cedar Falls & Northern Ry. Co.
York Railways Company



Don't wait for new cars to show you Perry-Hartman bearing economies—they fit almost any old truck. Send for catalogue and dimension data sheet.

Put Them On Your Old Cars

Holden & White

Electric Railway Distributors for the Joliet Railway Supply Company

1508 Fisher Building, Chicago

National Railway Appliance Co., New York and Washington; Grayson Railway Supply Company, St. Louis; C. E. A. Carr Co., Toronto; W. M. McClintock, St. Paul; Alfred Connor, Denver; O. H. Davidson Equipment Co., Salt Lake City; F. F. Bodler, San Francisco; S. I. Wailes, Los Angeles; W. F. McKenney, Portland, Ore.

Reduced 40%

Trolley Wire Costs and Maintenance

That's what every road that uses

Aristos "COPPERWELD" Copper Clad TROLLEY Wire

has found. And not only that—but they find that "Copperweld" stays up more than twice as long as the ordinary copper wire, and since it's on the job breakdowns and the consequent delays are down to a minimum. What about your road?

Western Sales Office:
Steel Sales Corporation
Chicago, Illinois

Eastern Sales Office:
Page Woven Wire Fence Co.
30 Church St., New York

Made from the product of COPPER CLAD STEEL CO., Pittsburgh, Pa.
Drawn and Sold Exclusively by

PAGE WOVEN WIRE FENCE COMPANY

MONESSEN, PA.

DREW SAFETY MIRRORS

enable you to handle summer traffic safely, quickly and more economically

Quick, nervous crowds—hurrying pleasure seekers, strangers in your city, women and children boarding your cars at the parks, and the host of feeble and infirm, that fair weather makes your passengers, demand the service that you can only secure from Drew Safety Mirrors.

This shows a Drew Mirror installed on a closed car. It acts as a valuable check on conductors' signals. Should passengers fall in boarding, the motorman does not start the car.

On open cars, the Drew Mirror gives the motorman a view of the running board so that he can co-operate intelligently with the conductor.

How the Drew Safety Mirror works and saves money for you

Installed on open or closed car—the Drew Mirror gives the motorman a clear view of the loading platform and running board without detracting his attention from the road ahead. He can watch traffic signals and passengers at the same time. This provides a very valuable check on stop and go signals. It obviates the majority of platform accidents and saves running time.

Thoroughly useful in every season

You'll note the decrease of claims from platform accidents as soon as your operators become familiar with the use of the device. This takes but a few days at most. The saving is as gratifying in winter as in summer and equally procurable.

One accident prevented more than pays for equipping all your cars

You'll save many times the amount in your Claim Department that it will cost you under the direction of your Master Mechanic to equip *every* car with Drew Safety Mirrors. Their cost is low, $3.50 for the regular type—$4.50 for prepayment and one-man types.

Send for Details of Free 60-day Test on your property

The experience of over 400 roads makes us confident that you can make the same gratifying savings on your property. Earlier action means earlier enjoyment of the savings. Send car specifications for trial mirrors—so that you can be the judge.

Drew Electric & Mfg. Co.

Office and Works, Indianapolis, Ind.

District Representatives in Principal Cities

DREW OVERHEAD LINE MATERIAL IS STANDARD ON KEENLY MANAGED ROADS. GET QUOTATIONS

PROOF

Long Life, Strength

Western Red Cedar Poles

18 Years—Heavy Load—Poles in Good Condition

DATA

Lines of Wisconsin Telephone Company.

Location — Green Bay, Wisconsin.

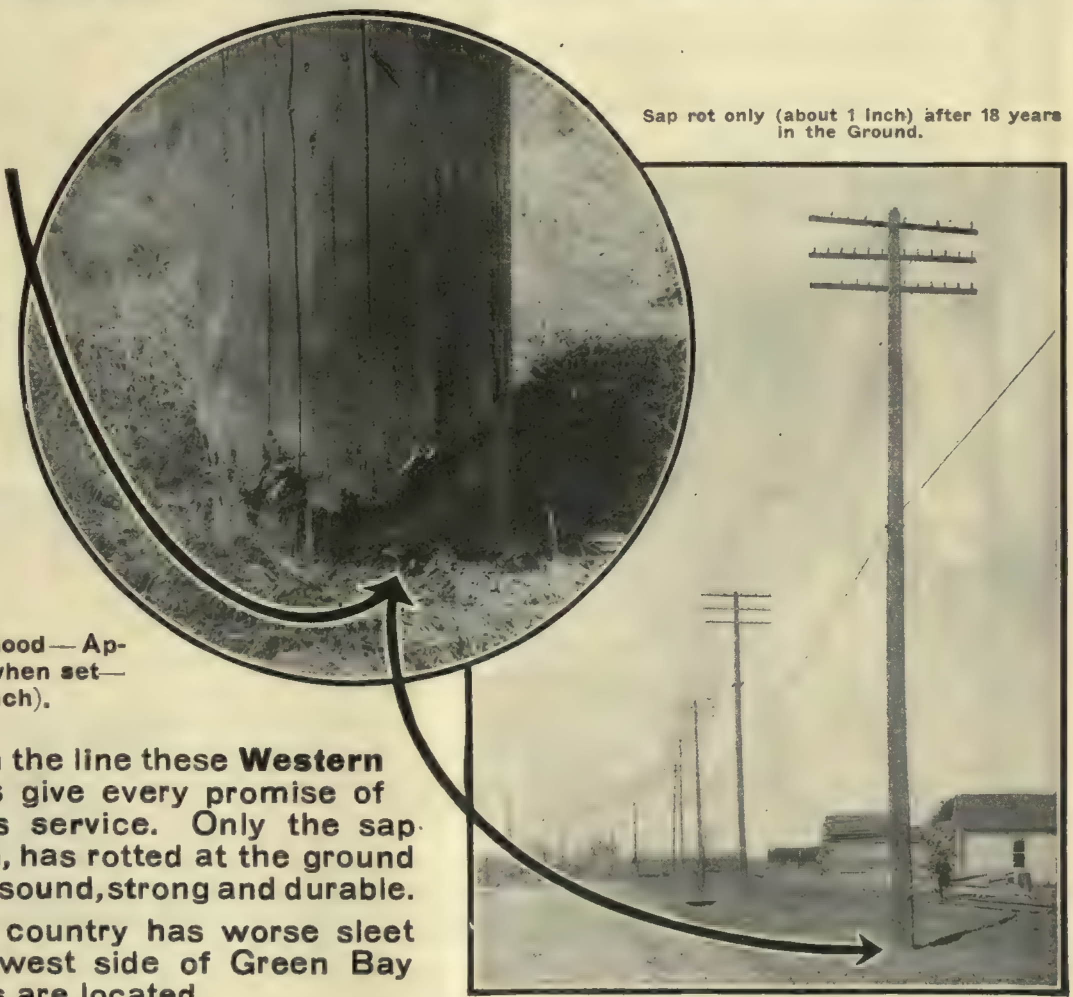
When Built—1899.

Poles—50′ 8″ Western Red Cedar—Untreated.

Load Now Being Carried:

- 18—No. 12 Copper Wires.
- 2—No. 8 Copper Wires.
- 3—No. 8 Iron Wires.
- 2—No. 6 Iron Wires.
- 1—50 Pr. Lead Incased Cable.

Condition of Poles—Good—Apparently as sound as when set—Sap rot only (about 1 inch).



Sap rot only (about 1 inch) after 18 years in the Ground.

Western Red Cedar Pole Line at Green Bay, Wisconsin, built in 1899.

After 18 years in the line these **Western Red Cedar Poles** give every promise of many more years service. Only the sap wood, about 1 inch, has rotted at the ground line. The poles are sound, strong and durable.

No part of the country has worse sleet storms than the west side of Green Bay where these poles are located.

For **Long Life, Beauty, Strength** and **Low Cost** use

WESTERN RED CEDAR

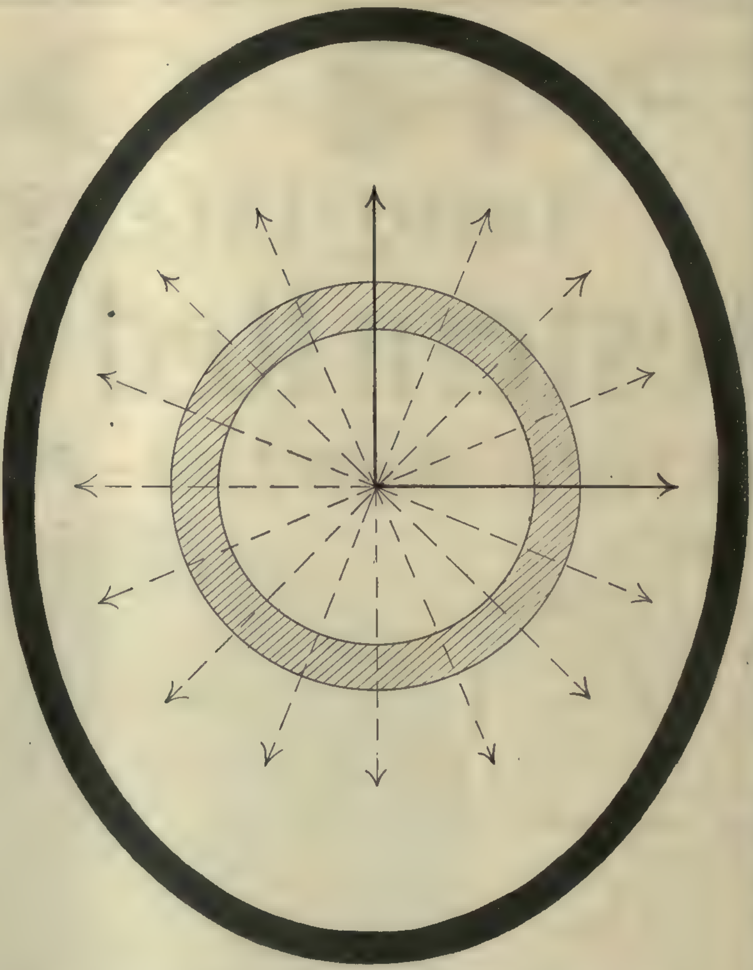
Write Us for Further Information

WESTERN RED CEDAR ASSOCIATION

SPOKANE, WASHINGTON

ELRECO Tubular Poles

show same deflection under load applied in any direction



Applying a given load to a Tubular Steel Pole at right angles to its length produces same stress regardless of the direction in which the load may be applied.

Because of its circular form, the Elreco Tubular Pole is the only pole that can be installed without regard to the direction or strain of load to be carried.

You know how important this feature is whenever you want a pole to take strains from several different directions. Elreco Poles simplify installation and construction engineering work.

Why should you install two poles of other shapes for corners or curves when one Elreco Tubular Pole would serve?

Elreco Tubular Poles also have much reserve strength. The extra tension from a span wire which has been struck violently by a car pole produces no permanent set. Actual service under all conditions shows that Elreco Poles excel in this regard.

Catalog No. 16 contains most valuable and useful data on "Pole Engineering." Write for your copy.

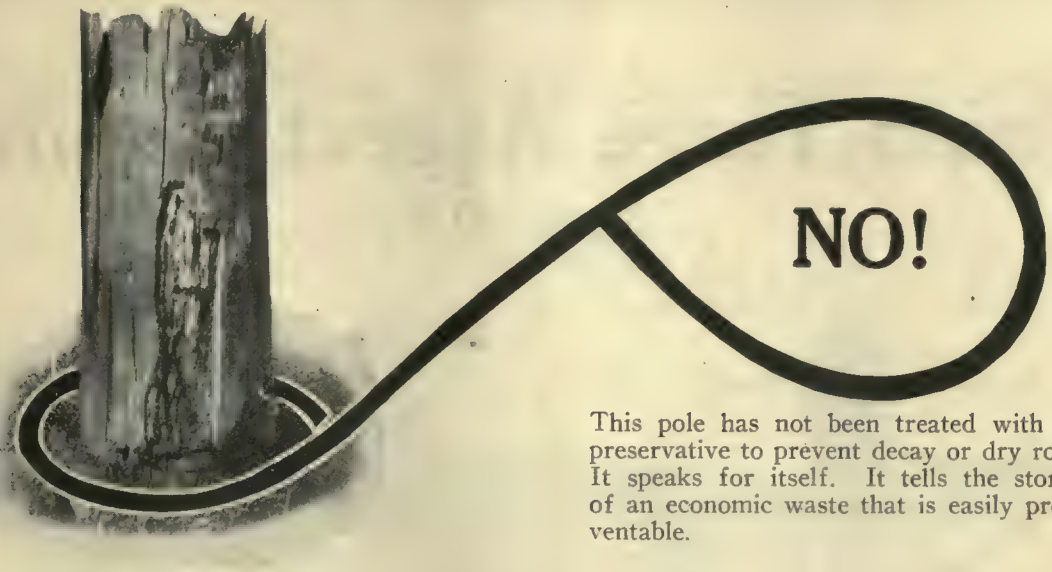
Elreco Tubular Poles

Combine

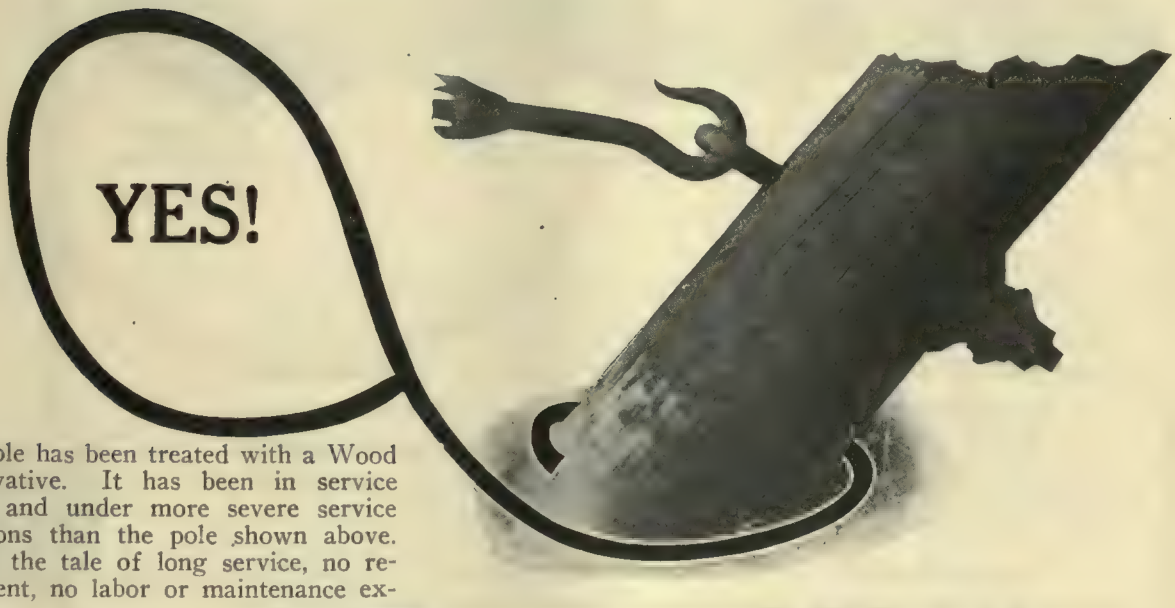
Lowest Cost
Lightest Weight
Least Maintenance
Greatest Adaptability

Electric Railway Equipment Co.

Cincinnati, Ohio
New York: 30 Church Street



This pole has not been treated with a preservative to prevent decay or dry rot. It speaks for itself. It tells the story of an economic waste that is easily preventable.



This pole has been treated with a Wood Preservative. It has been in service longer and under more severe service conditions than the pole shown above. It tells the tale of long service, no replacement, no labor or maintenance expense.

The Spot Test

You can easily detect impurities in a coal-tar preservative by placing a few drops on clean white blotting paper. The impurities gather in a spot in the center and in a short time their presence is clearly defined in a distinct zone. Try this test: Remember that these impurities are of no value, that they are a hindrance to the action of the preservative, that they represent a high percentage of cost from which you get no return. Try this test on the Reilly Preservative.

REILLY

Improved Wood Preservative

for open tank and brush treatment

This preservative enters into the very fibers of the wood and there it stays. The purity of the Reilly Improved Wood Preservative insures its effectiveness, stability and permanence. This preservative makes positive the long service life of Poles, Cross Arms, Ties and Structural Timbers.

We can furnish this specially treated standard timber or any treated special material on short notice. Reilly Improved Wood Preservative can be supplied in any quantity from a gallon to a carload.

Let us know your problem. We can supply valuable information to help you in its solution.

"It Stays in the Wood"

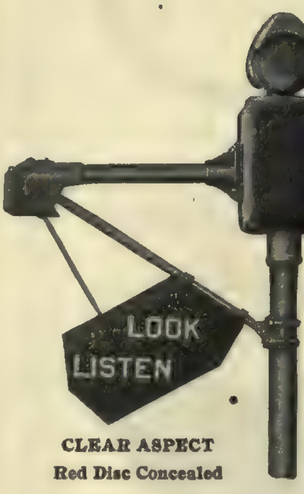
REPUBLIC CREOSOTING CO.

Indianapolis, Ind.

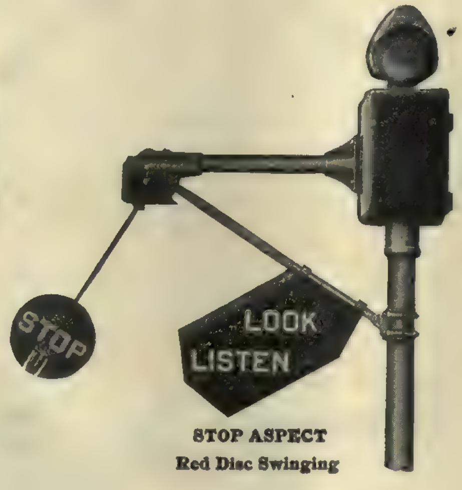
Plants: Indianapolis Mobile Minneapolis Seattle

Union Three Aspect Flagman

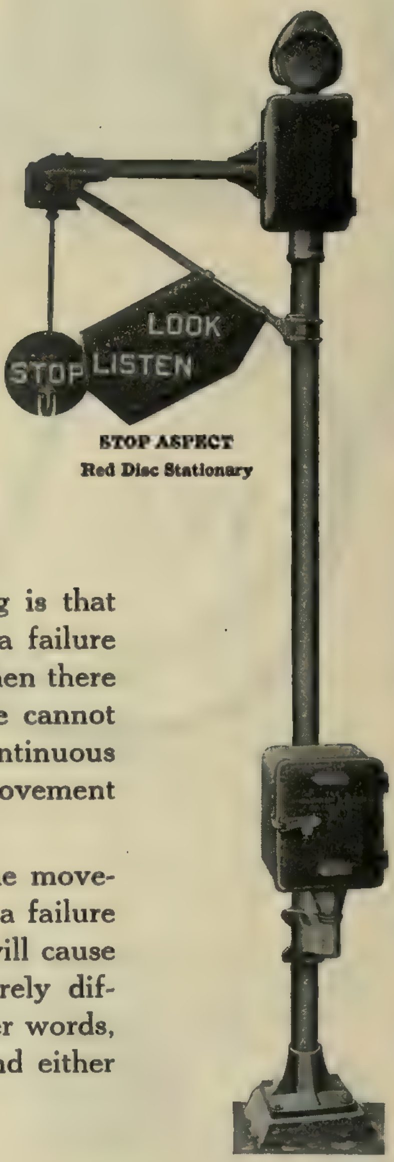
Style "DW"



CLEAR ASPECT
Red Disc Concealed



STOP ASPECT
Red Disc Swinging



STOP ASPECT
Red Disc Stationary

The most important principle in railway signaling is that which requires a signal to indicate stop when there is a failure of any part of the apparatus to function properly, or when there is an interruption of the power supply. This principle cannot be embodied in a signal indicating stop solely by the continuous movement of a disc or arm, because when such movement ceases for any reason the stop indication will be lost.

This signal, while displaying stop indication by the movement of a disc in normal operation, is so designed that a failure of any part of the apparatus or the absence of power will cause a second or emergency stop indication, which is entirely different and distinct from the proceed indication. In other words, this signal has three aspects, one indicating proceed and either of the other two indicating stop.

For additional information see Bulletin 86.

The Union Switch & Signal Co.

SWISSVALE, PA.

Trade Mark

Hudson Terminal Bldg.
NEW YORK

Peoples Gas Bldg.
CHICAGO

Canadian Express Bldg.
MONTREAL

Candler Annex
ATLANTA

Railway Exchange Bldg.
ST. LOUIS MO.

Pacific Bldg.
SAN FRANCISCO

Represented by the GENERAL ELECTRIC CO. in Australasia, South Africa and Argentina

Trade Mark

Eight exclusive features—count 'em

1 Does not splash mud or water when points are thrown.

2 Switch cannot be thrown between trucks by a following movement under contactor.

3 Has a positive anti-straddling device.

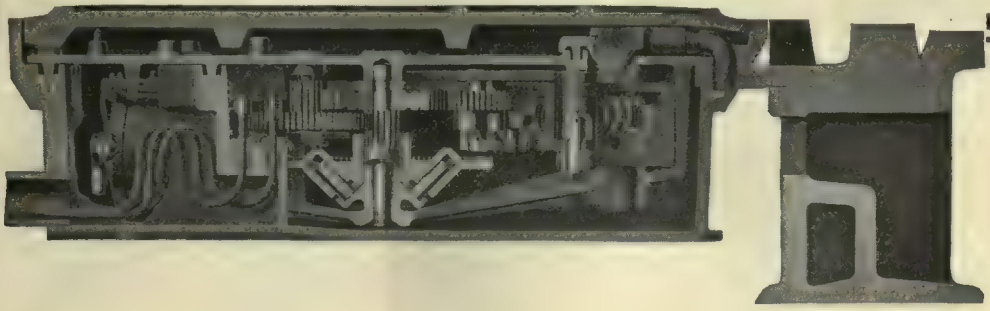
4 The entire mechanism can be lifted out of street box for inspection.

5 Street box is automatically sealed. No joints to make up.

6 Small contactors are easily mounted on standard ears.

7 Burnouts cannot occur from car standing under contactor.

8 Uses 110 volts reduced from trolley voltage.



That's what we mean when we tell you that you can't buy a better electric track switch than the Collins Non-Splitting

Surely you don't want a second best

United States Electric Signal Company

West Newton, Massachusetts

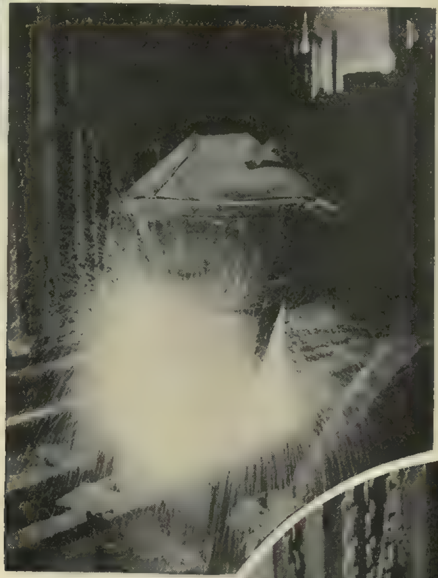
Representatives:
Western: Frank F. Bodler, Monadnock Bldg., San Francisco
W. F. McKenney, 54 First St., Portland, Ore.
Chicago: Warren Moore Osborn, McCormick Bldg.
Foreign: Forest City Electric Service Supply Company, Salford, Eng.

Approaching perfection

on the Viaduct Approaches of the
Omaha and Council Bluffs
Street Railway with

GOLDSCHMIDT THERMIT WELDS

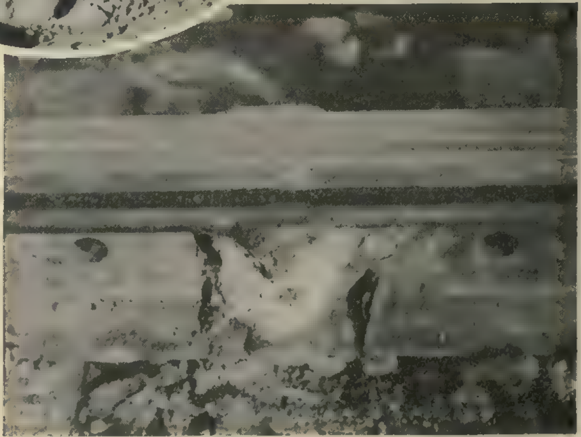
Placing the mould



Pouring the Weld

Welded Joint ready to be trimmed and ground

Finished weld



On this job the welds are being made between ordinary 70-lb. A. S. C. E. rail and Lorain Sec. 97-424 7″ groove rail.

That Goldschmidt Thermit Welds are superior in endurance and efficiency to other welds is evidenced by the fact that all the approach joints of this road are being Thermit welded.

Let us tell you how to get continuity of rail without continuity of joint expense.

Goldschmidt Thermit Co.

**120 Broadway
New York**

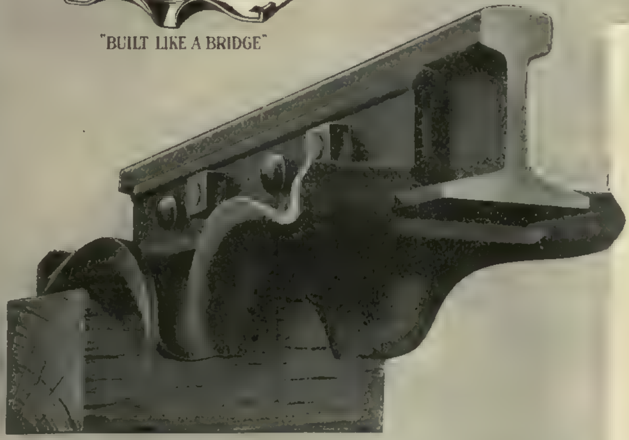
329-333 Folsom St., San Francisco 7300 So. Chicago Ave., Chicago 103 Richmond St., West, Toronto, Ont.

Abbott Rail-Joint Plates

—Primarily a joint support, but also a decided step toward

SAFETY FIRST

The ABBOTT RAIL JOINT PLATE
"BUILT LIKE A BRIDGE"



THE upturned corner lugs, locking the ends of the angle bars, prevent the joint from creeping.

Through contact with edges of the rail base, they also act as guides to preserve rail alignment if through accident or otherwise the angle bars break or come loose.

Further, the inward extension of the two lugs on the gage side of the rail to form hooks over and engage the rail base, arrest vertical motion or overturning of the rail.

The "Safety First" feature, prevention of wear and breakage, preservation of smooth-running track surface, protection to ties, decrease of maintenance, labor—all help to make Abbott Plates a splendid investment.

Ask for our booklet *"Improved Track Appliances."*

290

Lackawanna Steel Company

LACKAWANNA, N. Y.

ATLANTA	CHICAGO	DETROIT	ST. LOUIS
BOSTON	CINCINNATI	NEW YORK	SAN FRANCISCO
BUFFALO	CLEVELAND	PHILADELPHIA	HAVANA

Get these facts to your man —quick

TRACKOLINE

1 is a quicker, cheaper and more effective means of weed killing than burning or hand weeding.

TRACKOLINE

2 will not affect rails, ties or other parts of equipment.

TRACKOLINE

3 will kill every weed or sprig of grass on the right of way.

TRACKOLINE

4 once applied keeps the track clean for the rest of season.

TRACKOLINE

5 is cattle proof.

TRACKOLINE

6 sterilizes the ground — a smaller amount needed each year.

TRACKOLINE

7 is economical. One barrel for a mile of 8-ft. track.

Get these seven **facts — not theories**—into the hands of your man responsible for clean tracks.

Every one of them are attested to by railway men who use, know and appreciate Trackoline.

Weed burners fertilize the ground and strengthen the roots of the weeds.

Hand weeding doesn't get all the roots and it's too expensive today.

Trackoline is a powerful chemical agent—economical, effective.

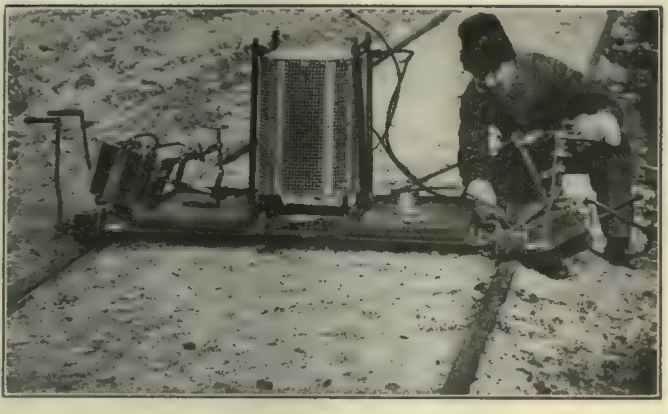
A "Trackoline Tract" should be in your hands. We'll mail a copy on request—by return mail.

PROTECTIVE MATERIALS CORP.

51 East 42d Street, NEW YORK

The Erico Portable Welder

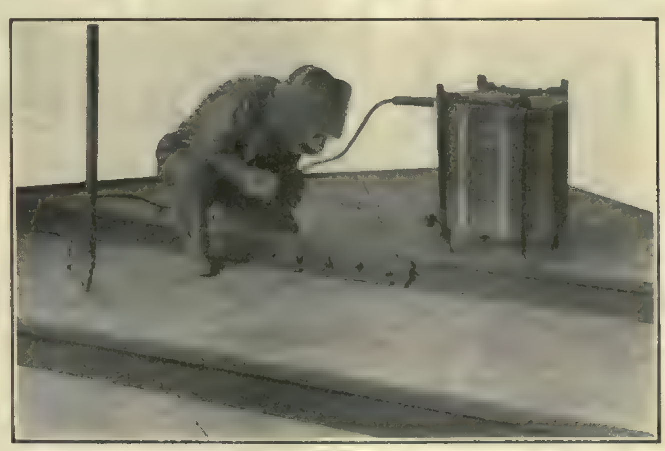
Rail Bonding
For Track Welding
Welding Car Equipment



Electric Weld Rail Bonding

When your Erico Portable Welder is not required for applying Erico Bonds by means of the welding furnace principle—

You can use the Erico rheostat as an arc-welding outfit to build up cupped joints and worn special work, or even to weld car equipment.



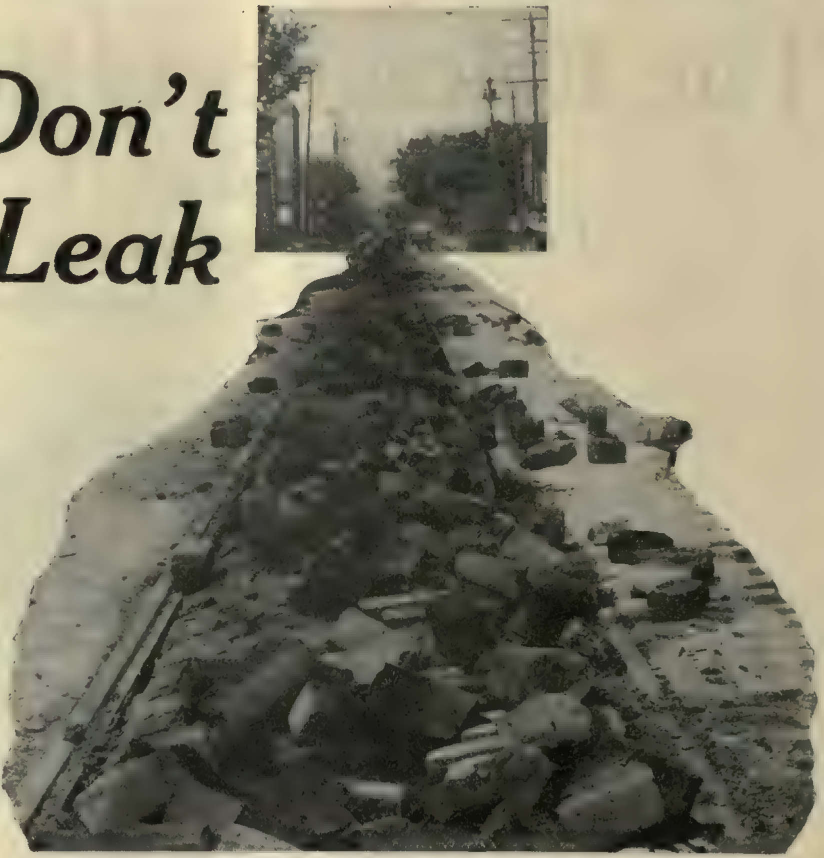
Arc Welding on Track

The Electric Railway Improvement Co.

Cleveland

If You Don't Stop the Leak

—You Will Have to Stem the Flood



Rail corrugations and bad joints are similar to the famous "leak in the dyke"—they are comparatively trifling in importance at the beginning, but unless prompt measures are taken they rapidly develop serious and far-reaching effects.

These incipient defects in rails are like the first little spot of decay in a tooth. If the dentist is permitted to get busy *right away* the progress of decay is stopped.

In the same way if a

Reciprocating Track Grinder

is put to work promptly upon the early appearance of corrugations or cupped joints it means a big eventual saving in time and cost of grinding and eliminates the necessity of grinding away so much of the wearing surface of the rail as would be necessary if the indentations are allowed to become deep.

And don't forget that merely because track is new is no sign that these "leaks" in track efficiency will not develop. It has been clearly shown that serious corrugation may show in track which has not been in service a month.

Trying to save expense by delaying track grinding until it becomes an absolute necessity is like trying to save money and trouble by delaying a visit to the dentist until the tooth begins to ache.

We are ready to prove the efficiency of Reciprocating Track Grinders on your own tracks without any risk to you.

Railway Track-work Co.

30th and Walnut Sts., Philadelphia

Coil Winding in the Seattle Shops of the Puget Sound Light & Power Co.

Seattle's Deltabeston Record

'Way back in August, 1903, The Puget Sound Traction, Light & Power Company, Seattle Division, began to rewind its motors with Deltabeston wire. At that time, the fields of the overworked motors were completely burned out in ten months.

So many motors were rehabilitated that more than 40 tons of Deltabeston wire were required.

Since then 158 of the smallest and oldest motors have been scrapped because Seattle operation had outgrown them, but hundreds of others are still in service, having served

Fourteen Years Without a Breakdown

The D & W standard that has permitted Deltabeston wire to make such a wonderful record at Seattle in getting excess output from old motors is the standard which is characteristic of every product of this company. We are ready to improve the output and the maintenance quality of either wire-wound or ribbon-wound fields.

Deltabeston Magnet Wire—Delta Tape—Delta Sheeting

DELTABESTON WIRE
REG. U.S. PAT. OFF.

D & W FUSE CO.

PROVIDENCE, R. I.

A. Hall Berry, 97 Warren St., New York

D&W
REG. U.S. PAT. OFF.

Agents—Pettingell-Andrews Company Western Electric Company Central Electric Company

Car Advertising also has its Jitneys

The company or individual of some experience but limited in organization and scope of operation which offers you some absurdly high price for your car advertising space is the JITNEY in the car advertising field.

Like the jitney, they cannot succeed because they cannot give the ***service.***

Passengers do not buy an advertised article unless it is advertised convincingly and attractively.

Sooner or later the buyers of jitney advertising discover the imposition and withdraw. Thus the advertising value of your car space is depreciated and you lose in the end.

The advertising jitney does not put value ***into*** car advertising—instead he takes value ***out*** of car advertising.

COLLIER SERVICE is the stabilizer which means a steady income from your car advertising space.

Barron G. Collier
INCORPORATED

Candler Building

220 West 42nd Street, New York City

DURADUCT

Car Wiring Conduit

Is Ideal for Remodeled Cars

If you are modernizing old cars by adding safety and speed-up specialties, you want to be assured of two things—

That you are not going to add to the burdens of motors made for lighter service—

That you are going to have adequate protection for the wiring of the new push-buttons, door-signal interlocks and other modern devices.

The lightness of Duraduct—ounces per foot instead of pounds per foot—and its availability for every need from 1/4 in. to 2 in. diameter have made it the favorite conduit for remodeled cars.

Approved by the Underwriters' Laboratories

Sample on Request

TUBULAR WOVEN FABRIC COMPANY
MANUFACTURERS ——PAWTUCKET, R. I.
GENERAL SALES AGENT — A HALL BERRY
71-73 Murray St., New York. 9 So. Clinton St., Chicago

Northern Electric Company LIMITED *Distributors for Canada*

The Arthur Powe

Saves Power, Brake Shoe
of Operation by Encouragin

It achieves these results by automatically recording the **amount of time** in minutes for which brakes are applied and by recording the **number of times** brakes are applied during a run.

It is extremely simple. Entirely mechanical. Requires only one instrument per car.

It is held in place by a single screw and is connected to the train pipe by a short length of ¼-inch pipe much in the same way as the

Its advantages may b

It encourages coasting
for the motorman soon learns that under equal conditions the man who coasts the most must of necessity have his brakes on the least.

It eliminates unnecessary stops and slow downs
as instance when one car follows a preceding car too closely.

It therefore saves power
by indicating the operator who uses the least power for maintaining a given schedule.

It develops safety by maintaining proper headway
The operator soon learns that following a preceding car too closely forces him to more frequent use of brakes and makes a bad record for him, when compared with a man who has exercised greater caution.

It checks excessive speed
A motorman soon learns that unnecessary "speeding up" entails more frequent and longer brake applications, which give him a bad record on both dials.

It encourages use of hand brake at end of run
This essential safety rule is often neglected by motormen. Its observance when the Arthur Power-Saving Recorder is in use gives the operator a better record. In fact, in this instance as in others, the motormen who observe the rules most closely get the best record.

If interested in power-saving, investigate the merits

The Arthur Power-Saving Recorder Co.
New Haven, Conn.

-Saving Recorder

and Wheels, Increases Safety
Motormen to Run Cars Properly

pressure gauge is connected. Absolutely no auxiliary equipment is needed, and the complete cost of labor and material for installation is very small.

It is in service on 200 cars of the Connecticut Company, and its use is now being extended to cover the whole system of this company, i.e., it will shortly be in operation on practically all cars in the State of Connecticut.

Showing recorder location on one of the cars of the Connecticut Company

ummarized as follows:

"Fanning the air"

One of the worst habits of a motorman is "fanning the air," as it is called. This consists in throwing the brakes on and off when making a stop instead of stopping smoothly. This results in the uncomfortable jerking about of passengers, and in addition wears away brake valves, seatings, governors, compressors, compressor motors, etc. It also wastes compressed air and wastes power by requiring the more frequent pumping up of the reservoir. All of this is annoying and wasteful. The Recorder checks this, for each time a motorman "fans the air" the device registers one against him, as well as lengthens his braking period. The device effectively eradicates this bad habit.

It encourages the use of sand on slippery rails and so lessens the possibility of flat wheels.

It educates operators to take frogs and switches at proper speed and so decreases risk of derailments.

It teaches motormen to observe condition of equipment closely and report defects promptly.

It gives motormen an incentive to observe the rule for draining air tanks when car goes to barn and consequently decreases risk of injury to piping and tanks during freezing weather.

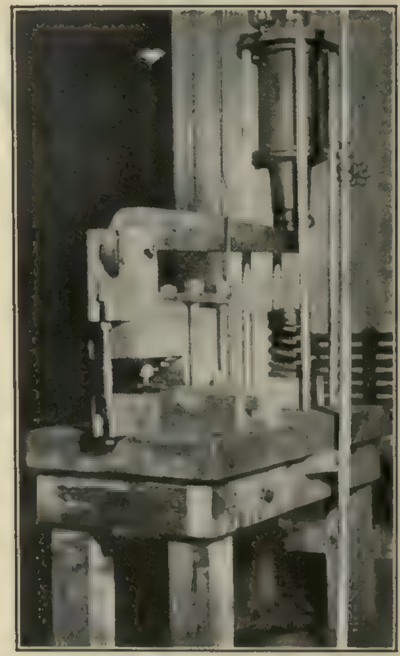
It operates uniformly on any car without regard to size or weight of car, gear ratios, wheel diameters, and thereby greatly simplifies clerical work in figuring and keeping motormen's records.

It does the work and does it well, being mechanically simple, with few parts to get out of order, both its first cost and maintenance cost is relatively low.

his new Recorder. Its simplicity will appeal to you.

The Arthur Power-Saving Recorder Co.
New Haven, Conn.

Did You See It?



Air-Operated Punch with Heavy Spring Which Acts as a Shock Absorber

THIS mighty useful little "Home-Made Air-Operated Punch" was described in the May 5 issue of the Electric Railway Journal.

It isn't a revolutionary device but it is just one of those little ideas which you, Mr. Master Mechanic, or you, Mr. Shop Foreman, may not have thought of but which would save energy for yourself and money for your company.

You miss many of these ideas when you depend upon that copy of the Journal which is accessible to you and half a dozen other officials. You don't have a chance to read all of it every week.

If you are not already taking a personal copy of the Journal, enter a subscription at your home address. Use part of one evening a week to go through the paper and clip out articles which will help you. Take them to the shop and keep them handy.

The investment is only $3 a year. The returns depend upon you. You can make them unlimited if you use the paper in the right way. Send us your order for your own personal copy of the Journal today.

Electric Railway Journal

239 West 39th Street, New York

New Orleans War-Time Economies

OXWELD EQUIPMENT

Saves $278 in a Day

The savings railways are making with Oxweld Equipment would astound you if you could review them all.

For example, New Orleans Ry. & Light Co. welds, in one 9-hour day, as many as eight broken frames of Lord Baltimore trucks. Each new frame costs $36. Eight old frames are made *new* for $3 of labor, $1 (25 lb.) of carbide, and $6 (400 cu. ft.) of oxygen—$10 instead of $288! And there are no spare frames to carry—no idle cars waiting for shipments to arrive.

Another New Orleans stunt is to *build up*—instead of boring out—worn motor housings. With Oxweld (Injector Type) Blowpipe they get a soft, easily-machined weld that can be readily rebored to the original size. Thus, the original bearings may be used, avoiding the delays and extra cost of special sized bearings.

By all means, your own shop should enjoy the advantages of Oxweld Equipment and

OXWELD SERVICE

This service is so broad and helpful that more and more companies are buying "Oxweld for Service."

Ask for Bulletin Series 700-R. Find out about it now.

OXWELD ACETYLENE COMPANY

LARGEST MAKERS OF OXY-ACETYLENE APPARATUS AND SUPPLIES IN THE UNITED STATES

NEWARK, N. J. CHICAGO LOS ANGELES

Stand behind the men behind the guns

BUY A LIBERTY LOAN BOND

AND HELP WIN THE WAR

Interest 3½%.

Issued by the United States Government.

Denominations: $50, $100, $500, $1000, $5,000, $10,000, $50,000 and $100,000.

FIRST PAYMENT AS LOW AS ONE DOLLAR

★★★★★★★

Ask any Banker, Postmaster, Express Company or Merchant for an Official Application Blank and—Apply for Your Liberty Loan Bond Today.

★★★★★★

Subscriptions must be placed in time to reach the Treasury Department or a Federal Reserve Bank by noon, June 15, 1917.

Payments on a $50 Bond are as follows:

2% on Application	[$1]
18% on June 28, 1917	[$9]
20% on July 30, 1917	[$10]
30% on August 15, 1917	[$15]
30% on August 30, 1917	[$15]

Subscribers may pay in full if desired

A TRIBUTE TO THE FLAG AND THE SAFEST INVESTMENT IN THE WORLD

A Liberty Loan Bond is Uncle Sam's promise to pay — *and he is worth* $225,000,000,000.

IF YOU WANT PROOFS

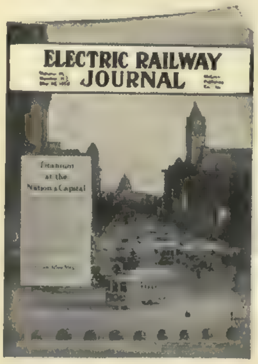
of your advertisements, and time to return them with corrections

Copy Must Be in Our Hands Two Weeks in Advance of Publication Date

Copy Changes. If no proofs are desired your advertisements should be in our hands Wednesday of the week preceding date of publication, otherwise your latest advertisement in accordance with schedule will be repeated.

New Advertisements (not changes of copy) can usually be accepted up to noon Wednesday of the week of publication, but no guarantee can be given as to location or proofs or indexing.

Searchlight Advertisements (Proposals, Wants, For Sale, etc.) received as late as 10 A. M. Thursday will be published if there is space available in the pages that go to press last. The paper is dated and mailed Saturday.



THESE are not arbitrary rules. We do our best to give our advertisers what they want—work overtime if necessary—but each advertising form has to be on the press at a specified time. That is why we cannot guarantee proof or location unless we have copy on time. We want our advertising space to work at maximum efficiency for our advertisers.

The Paper is dated and mailed Saturday

Electric Railway Journal, 239 W. 39th St., New York

New Orleans Trolley Wheel Satisfaction

begins at the

TRADE MARK

Bound Brook Bushings

REG. U. S. PAT. OFF.

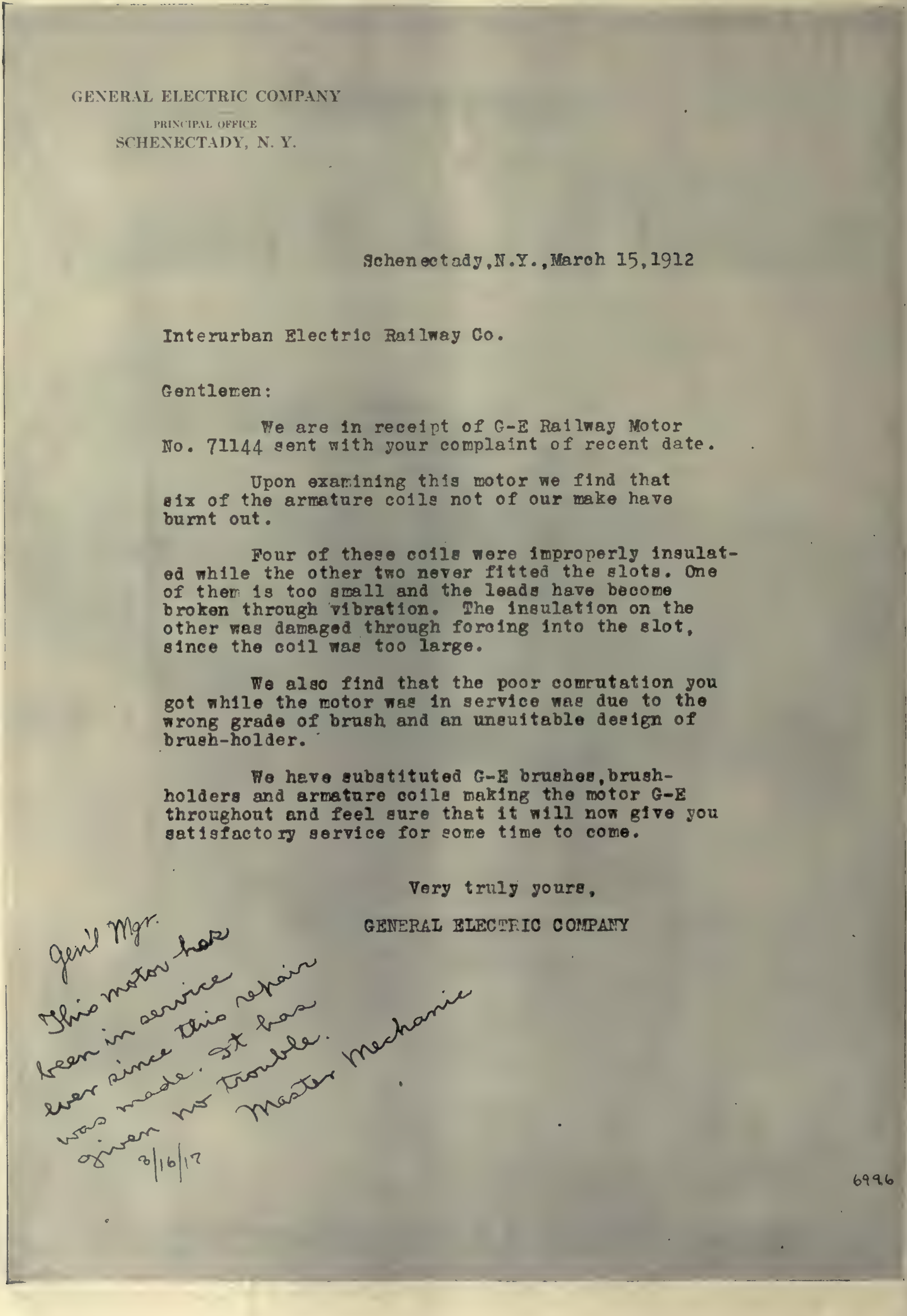
Whether operating over busy Canal Street or charming St. Charles Street, current collection on New Orleans cars is smooth and satisfactory.

Why not—when almost every trolley wheel on the system is fitted with the famous Bound Brook Graphite Oil-less Bushing—the surest, safest, simplest way known to keep a trolley wheel true to its job.

All genuine graphited "Oil-less Bearings" have always been made at Bound Brook, N. J., in the United States of America, by the

Bound Brook Oil-less Bearing Co.

Formerly Graphite Lubricating Co.



GENERAL ELECTRIC COMPANY
PRINCIPAL OFFICE
SCHENECTADY, N. Y.

Schenectady, N.Y., March 15, 1912

Interurban Electric Railway Co.

Gentlemen:

We are in receipt of G-E Railway Motor No. 71144 sent with your complaint of recent date.

Upon examining this motor we find that six of the armature coils not of our make have burnt out.

Four of these coils were improperly insulated while the other two never fitted the slots. One of them is too small and the leads have become broken through vibration. The insulation on the other was damaged through forcing into the slot, since the coil was too large.

We also find that the poor commutation you got while the motor was in service was due to the wrong grade of brush and an unsuitable design of brush-holder.

We have substituted G-E brushes, brush-holders and armature coils making the motor G-E throughout and feel sure that it will now give you satisfactory service for some time to come.

Very truly yours,

GENERAL ELECTRIC COMPANY

Gen'l Mgr.
This motor has been in service ever since this repair was made. It has given no trouble.
Master Mechanic
3/16/17

6996

Electric Railway Journal

Published by the McGraw-Hill Publishing Company, Inc.
Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIX NEW YORK, SATURDAY, JUNE 2, 1917 Number 22

PUBLICITY AND THE SKIP STOP

By means of a well-planned, persistent and frank method of publicity, the United Railways & Electric Company has secured public support for the adoption of the skip stop on two of its lines in Baltimore. Electric railway officials ought to be greatly interested this week in Mr. Burroughs' story of how this result has been secured. In the main, the skip-stop idea has been sold to the conservative Baltimore public upon the basis of time-saving. There have been objectors, of course, but it has been apparent that the motive in practically all cases was pure selfishness, and the serious-minded part of the public, we imagine, has not been slow to see this point. The success of the plan in Baltimore, which already has resulted in faster schedules, more service and a saving in operating costs, should encourage other electric railways to try to adopt this skip-stop plan. There will be, in almost any city, a certain amount of public inertia or unreasoning hostility, but if the advantages of the plan are thoroughly and frankly explained, we believe that public interest will be aroused and that most of the arbitrary opposition will be overcome. Without doubt the present moment is the psychological one for pressing the point, for the admitted need of conservation of national resources of all sorts may well make the public look more sensibly upon efforts to use improved methods of operation.

GOVERNMENT OWNERSHIP IS NOT A SOLUTION

Of late the burdens of railroad and utility operation have grown to such volume that it has become evident that, if private corporations serving the public are to progress, they must have more revenues. In some cases, however, the old cry has been raised, why not government or municipal ownership and operation? The inference, of course, is that with given rates the publicly managed corporation can attain prosperity and a state of full development much more easily than can the private company. Nothing could be further from the truth. In support of this contention we wish to cite the opinion of W. M. Acworth, the noted English authority, as recently expressed before a special hearing of the Newlands joint committee on interstate commerce. In his opinion, history conclusively refutes the idea that government ownership promotes development. If, under existing rates, private capital is not being found in sufficient quantity for extensions and improvements that are urgently necessary, to suppose that "serious statesmen" would for this reason decide on government ownership is to suppose the impossible. To compare the burden on the public of such a step, Mr. Acworth believes, with the alternative of allowing the existing companies to raise their rates by a small amount, which would make all the difference between poverty and affluence, would be almost "farcical." Thus speaks a man who knows.

MAKE IT A 100-PER CENT CAMPAIGN

The present movement for higher fares on electric railways to compensate, in part, for increased cost of operation should not mean a cessation on their part, or on the part of the commissions, to introduce all possible economies which will not impair the service. A 6-cent fare instead of a 5-cent fare is equivalent to only a 20 per cent increase, and this is small compared with the increase in cost of many, if not most, of the factors which go to make up the cost of electric railway operation. Constant effort for economies, therefore, is just as necessary now as ever before. Indeed, it should be pressed even more vigorously. Skip stops, as introduced in Baltimore and elsewhere, will help some. There should be continuous effort to introduce one-man cars on those lines which are suitable for such service. Economies possible through schedule rearrangement and rerouting of cars should constantly be studied, as should all minor economies in railway operation. Railway companies have had more liberty of action with these minor economies and have paid so much attention to them during the past ten years that it is certain that only slight gains are possible there. But with conditions as they are, and as they promise to continue for some years, the 6-cent fare will have to be supplemented by every device and method toward economical operation and efficient service which is not only within the power of the companies to adopt but within the power of the communities to grant.

POPULAR BOND SUBSCRIPTIONS ARE NECESSARY

We pointed out two weeks ago ways in which the electric railways could help in the sale of the Liberty Bonds. The size of the issue makes new methods of flotation necessary. Of course, as most if not all of the money raised by the loan will be spent here, the net financial effect in this country will be a redistribution of money rather than a loss of it. The chief problem is so to distribute the subscriptions that the strain will not fall too severely in any one place. This would be the case if the banks or those interested in large enterprises should take up the entire amount, as it would limit their ability to use their credit in necessary industrial and financial operations. But if the small investor participates, the load will be easily carried. And there is every reason why he should. If the war continues and other bond issues at a higher rate are necessary, the present bonds are convertible to those issued at the higher rate. On the other hand, if the war should come to an early close, the bonds will undoubtedly go to a considerable premium. In addition, there is the patriotic feeling which every subscriber will have, that he is helping his government to win the war. Many railways during the past week have entered subscriptions for these bonds and have offered them for resale to their employees on easy terms. This plan allows the men to pay for the bonds, wholly or in large part, out of future earnings.

EFFECT OF THE CONSCRIPTION ACT

Now that the conscription law has finally been passed by Congress it becomes possible to speculate on the approximate effect upon the electric railway industry. The age limits of twenty-one to thirty, inclusive, for those subject to registration for the draft include roughly one-third of the employees on the average electric railway, although on one large property the fraction is given as only one-fourth. Of these registrants, only part will be made subject to actual draft, the proportion depending both upon the relative number of exempted registrants among the electric railway employees (this covering men relieved because of physical and other defects and because of having dependents) and upon the ratio of the number of men engaged in exempted and in non-exempted occupations. The effect of the former factor may be nullified by assuming that the electric railways are similar to all other industries in regard to the proportion of men supporting dependents and in regard to the relative number of employees that are fit for military duty. This latter is not strictly true owing to the high physical standard required of railway men, but the assumption would properly apply if the physical requirements for the army were made low enough.

The other factor—that of the relative number of men employed and exempt in the industries throughout the country—is difficult to estimate. Agriculture and seafaring are the two principal industries "necessary to the maintenance of the military establishment, or the effective operation of the military forces, or the maintenance of the national interests" mentioned in the act as being causes for exemption, but this does not necessarily mean that all men nominally in these lines of work will be exempted. On the other hand, undoubtedly many now engaged in munitions manufacture, shipbuilding and certain other lines of work will be kept at their present employment. As the Census Bureau has estimated that agriculture, manufacturing, public service and mining occupy 64 per cent of the men within the military draft age limit and that the total number of registrants will be 10,000,000, approximately two-thirds may be exempted. There would then be left only 3,300,000 from which the first draft of a half million can be made. On this basis the first draft, which will come in September, must include 15 per cent of the registrants from the non-exempted industries, and if the electric railways are to be included in that category they must prepare to face a loss of at least 15 per cent of the registrants that they employ. Since the registrants, as before mentioned, constitute about one-third of the total number of electric railway employees, the loss will probably be not less than 5 per cent of the whole force and possibly more, depending largely upon the strictness of the army physical examination and the exemptions granted in other industries.

THE 6-CENT FARE MUST COME

The 6-cent fare movement is gathering momentum. It is true that in some cities, notably New York, the companies are seeking only to obtain the right to charge 2 cents for transfers. But the conditions in New York are radically different from those in most other cities. A charge for transfers will meet the need of the companies in New York, but it will not give the necessary relief in other cities.

That was a very interesting letter which President Shonts of the New York Railways Company wrote to Mayor Mitchel. The Mayor had suggested in a public statement that there was no reason why public utilities should be exempt from the sacrifices which had to be universally borne in such a national emergency as that now confronting the country. Mr. Shonts very properly pointed out, however, that not only were public utilities not exempt in any sense from the burdens of taxation, high cost of living, etc., which the entire community had to bear, but that so far the public utilities constituted practically the only industry which, because of public regulation, had not been permitted to adjust itself to the changed economic conditions which confronted it. Mr. Shonts added: "It has been the long continued practice of the United States government to charge 2 cents for letter postage, but in the current revenue bill it is proposed to increase the postage to 3 cents. The steel companies have heavy burdens, and they raise their prices. Bakers must pay more for their flour, and they raise the price of bread. The old-fashioned 'dollar' watch now sells for $1.35. The 5-cent package of biscuit now retails at 8 cents. The newspapers pay more for their paper, and there is a very general movement to increase the price of newspapers from 1 to 2 cents."

A number of the New York papers are urging that the 5-cent fare has been established so long as to have the sacredness of a public institution. That point of view is the only barrier to the sensible solution of this problem. As an economic proposition it is of course too absurd to argue, but as a political shiboleth it has undoubted importance. It is one of the most unfortunate facts of the situation that apparently it cannot be dealt with without reference to political considerations.

It is, however, undoubtedly true that if the rule of the 5-cent fare is to be regarded as inviolable, a great many states are going to be compelled to undertake municipal ownership whether they want it or not. When they do that, the deficit is likely to be passed on to the taxpayer, who will pass it on to the rent-payer, and eventually it will make the burden of the public heavier than ever. Certain it is that 6 cents worth of service cannot be given for 5 cents. Somebody has got to pay in the long run whatever the service costs. Municipal ownership would mean extravagance, corruption, and pork-barrel methods.

But this fact ought not to be forgotten: The American people are fair, even if they do want to be shown. Every company in the country should make it its business, without a moment's delay, to see to it that the public is shown exactly what the situation is now. It would be difficult to charge 6 cents for passengers in Rochester, N. Y., if people in Boston were riding for 5 cents. The state of the industry and the only prospect for a real development of the street railroading art rests upon raising the basis of street railway fares from 5 to 6 cents. Some companies will not need it. But such companies should offer to put the increased revenue into improving their service.

Every company in the country without delay should take steps to increase its fares. This act is justified by existing conditions and the prospects which confront us. It is an act primarily in the interest of the public service, because the public service is sure to suffer unless the companies can earn enough money to enable them to pay for a service of the highest quality. And such payment must involve not only adequate wages to employees and the market prices of commodities; it must include, as an indispensable charge, a fair return upon the capital invested.

COMMISSIONS AND UTILITIES ORGANIZE FOR NATIONAL DEFENSE

Public utilities throughout the country should follow the lead of those in New York City in forming a Committee on Public Service. Acting upon the initiative of Oscar S. Straus, chairman of the New York Public Service Commission of the First District—and in line with a suggestion made some time ago in the ELECTRIC RAILWAY JOURNAL—various street railroad companies, electric light companies and telephone companies have formed such an organization. It is unique in character and of great possibilities for usefulness. Commissioner Travis H. Whitney of the Public Service Commission is chairman of the executive committee, with Ivy L. Lee as secretary.

The scheme is to co-ordinate for effective service, during the war, all these various kinds of companies. One of the first problems considered has been that of co-operation with the Government to secure proper registration of all employees available for military duty. It will be necessary to secure the exemption of many such employees, but it has been felt that this problem should be considered by all of the utilities, so that, in the event of any of the companies suffering unusual hardship through the loss of men, the various companies could co-operate. Companies are to file with this executive committee a complete statement of all their facilities and materials on hand. This is to provide for emergencies. In case a power house or a plant of one of the companies should be blown up, for example, it is planned that the resources of the other companies will be immediately available to insure the continuous performance of the public service.

The executive committee is to meet once a week at the office of the Public Service Commission. These meetings are expected to bring about the suggestion and development of many plans not immediately related to operation of the individual companies. It has been suggested that each of the companies take steps at one of the early meetings to make it possible for their employees to subscribe, on easy terms, to the Liberty Loan.

It is believed that these weekly meetings, by bringing the leaders of the different companies together and encouraging the informal consideration of any matter which may come up, related to the welfare of the companies, their employees or the public they serve, will be of great helpfulness.

WE MUST STOP WASTING COAL

In a statement just issued to the press Francis S. Peabody, chairman of the National Coal Board, Council of National Defense, appeals to the people of the country to conserve the supply of fuel so that a sufficient quantity may be available for battleships, railroads, and munitions factories and all other enterprises that are making materials for use in the war. As large coal consumers the electric railways will take this appeal promptly to heart and plan for practical co-operation with the National Coal Board. Coal is to some extent wasted by electric railways both in generating electrical energy and in utilizing it. Incomplete combustion in the boiler furnace produces smoke and permits other combustibles to go up the chimney. Excess of air through the furnace also lowers economy. In the engine or turbine room waste goes on due to uneconomical loading of machinery and failure to maintain the best operating conditions of superheat, vacuum, etc. Electrical losses are probably not excessive on railway properties although they might be reduced in many cases, but after the energy gets to the car there is a splendid possibility of saving coal by wasting less energy in the brakeshoes. Cars can be operated with more coasting and, with the co-operation of the public, stops can be eliminated.

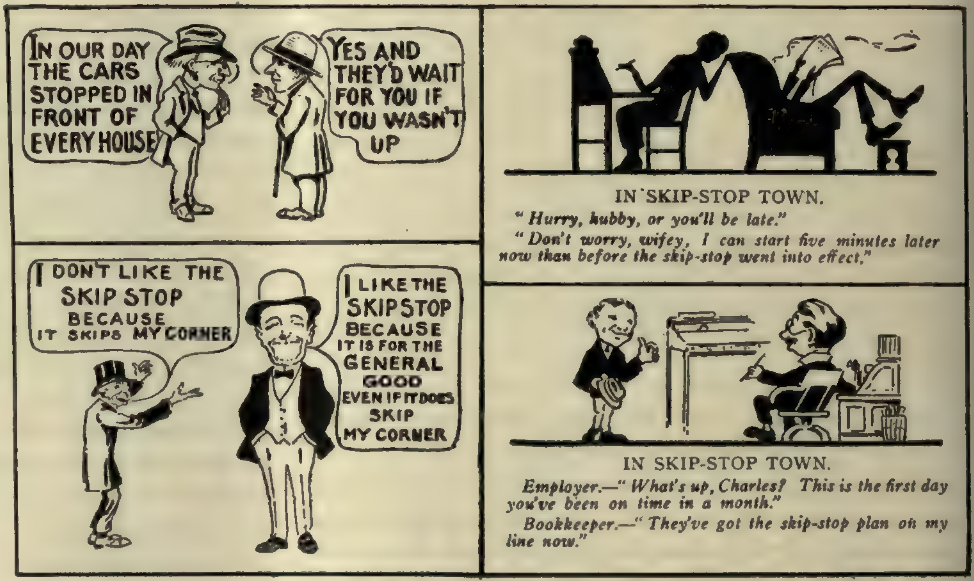
By careful attention to all possibilities in the line of energy, and therefore coal saving, any road which has not given the matter reasonable attention before could undoubtedly save from 10 to 20 per cent in the coal pile. Assuming that something like 9,000,000 tons of coal are used per annum in driving electric cars, a 10-per cent saving, or 900,000 tons, would furnish no small contribution toward the solution of the coal conservation problem. Then, too, electric railways purchase considerable energy from central stations. More economical car operation would reduce the amount of this, and the central station coal consumption could thus be reduced by possibly 500,000 tons. In the power plant we cannot expect yet to approach the ideal of 1 lb. of coal per kilowatt-hour referred to in a recent issue of the ELECTRIC RAILWAY JOURNAL, but we can certainly try for it. Neither can we expect to operate a car without wasting some energy in the brakeshoes, but we can certainly waste less than we have been doing.

Putting Across the Skip Stop in Baltimore

How the United Railways & Electric Company After Thorough Preparation Has Sold the Skip-Stop Plan to Some of Its Patrons on the Basis of Time-Saving—Reasoning Men Appreciate Its Advantages When Properly Explained

By DWIGHT BURROUGHS
Publicity Manager United Railways & Electric Company, Baltimore, Md.

IN its search for ways and means of bettering its service in Baltimore, the United Railways & Electric Company was impressed with the practicability of the skip-stop method of operation in certain other cities. The company decided, therefore, that this was worthy of consideration with a view of determining its applicability to the local car lines. It had in mind from the first, however, the question as to whether the people of the community would want the skip stop, even though better and more modern service should result.


IN OUR DAY THE CARS STOPPED IN FRONT OF EVERY HOUSE
YES AND THEY'D WAIT FOR YOU IF YOU WASN'T UP
I DON'T LIKE THE SKIP STOP BECAUSE IT SKIPS MY CORNER
I LIKE THE SKIPSTOP BECAUSE IT IS FOR THE GENERAL GOOD EVEN IF IT DOES SKIP MY CORNER

IN SKIP-STOP TOWN.

"Hurry, hubby, or you'll be late."

"Don't worry, wifey, I can start five minutes later now than before the skip-stop went into effect."

IN SKIP-STOP TOWN.

Employer.—"What's up, Charles? This is the first day you've been on time in a month."

Bookkeeper.—"They've got the skip-stop plan on my line now."

SKIP-STOP PUBLICITY—HOW THE CARTOONIST IN "TROLLEY NEWS" DROVE POINTS HOME

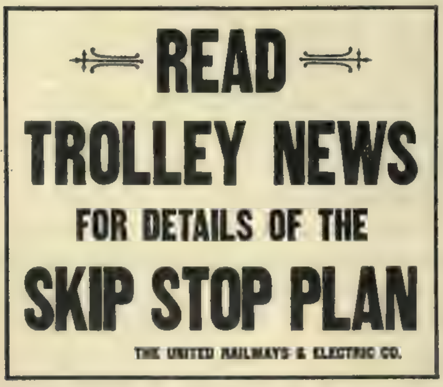
CONSERVATISM TO BE OVERCOME

Baltimoreans are known for their conservatism. Almost sixty years ago the proposition to establish a line of horse cars in the city met with such strenuous opposition from the merchants of the principal thoroughfare that the asked-for privilege of laying tracks was not granted. Many years later, when electricity was introduced on the city lines, this method of car propulsion met with opposition, and one of the foremost citizens denounced the electric cars as "roaring, rattling, screeching juggernauts." Moreover, at some points there was opposition to the substitution of smooth pavements for the time-honored cobblestones with which the streets were paved.

Hence, in deciding to study the advantages of the skip stop, the United Railways & Electric Company decided likewise to feel the public pulse. To do this fairly it was deemed necessary to inform the public thoroughly of the nature of the skip-stop method of operation by placing in its possession all relevant data and information that the company could amass.

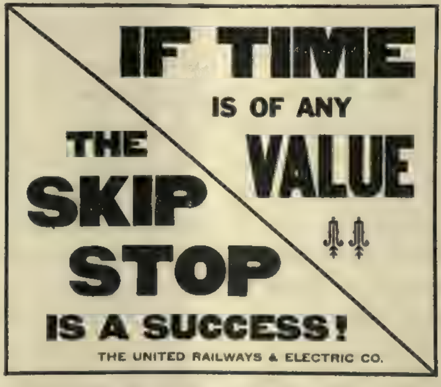
STUDYING UP ON THE SUBJECT

To serve these ends there was undertaken what was probably a much more thorough investigation of the skip-stop method than had been carried on anywhere else. All the resources of the company were employed to secure the very latest data concerning the working of the plan elsewhere. The American Electric Railway Association on request supplied all the information it had in its very extensive files relative to the experience of other cities. This information was very carefully digested, the principal features charted and all figures tabulated.



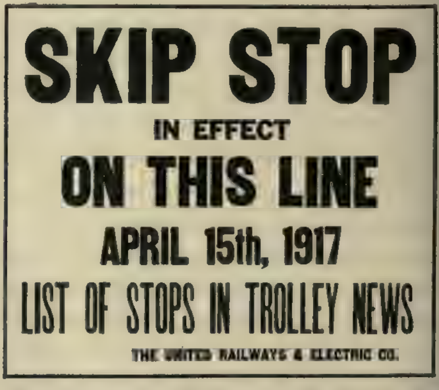
READ
TROLLEY NEWS
FOR DETAILS OF THE
SKIP STOP PLAN
THE UNITED RAILWAYS & ELECTRIC CO.

Card Placed in All Cars of System Ten Days Before Skip-Stop Plan Became Effective, and Left There for a Week After the Plan Went Into Operation



IF TIME
IS OF ANY
VALUE
THE
SKIP
STOP
IS A SUCCESS!
THE UNITED RAILWAYS & ELECTRIC CO.

Card Placed in Cars Two Weeks After Skip-Stop Plan Became Effective



SKIP STOP
IN EFFECT
ON THIS LINE
APRIL 15th, 1917
LIST OF STOPS IN TROLLEY NEWS
THE UNITED RAILWAYS & ELECTRIC CO.

Card Placed in All Cars of North Avenue and Edmondson Avenue Lines a Week Before the Skip-Stop Plan Went Into Operation in Baltimore

SKIP-STOP PUBLICITY—CAR CARDS USED TO ATTRACT PATRONS' ATTENTION TO THE SKIP-STOP PLAN

Representatives of the company were sent to various skip-stop cities to make a first-hand inspection of the mode and the success of operation, and to determine which of the features could properly be applied to Baltimore. At the same time a general survey was made of several lines in Baltimore to ascertain the practicability of the skip stop on them.

The result of this painstaking work was that all the good points of the several systems used elsewhere were adopted. Those features which it was felt had detracted from the success of the idea in other cities were discarded. Local conditions in Baltimore were always borne in mind, and an effort was made throughout to cater to the greatest convenience of the public.

BROACHING THE TOPIC

Satisfied after this study that the plan could be advantageously adopted in Baltimore, and that the people would be much benefited by its adoption, it was decided to present the entire plan to the people themselves and to invite them to decide whether they wanted a more progressive method of railway operation.

Before any announcement was made that the company had the adoption of the plan in view, however, the successful operation of the system in other cities was described in a brief article in the company's car pamphlet, *Trolley News*. This first article, which was entitled "Skip-Stop Plan—It Seems to Be Solving Difficulties," appeared on Feb. 1. The next issue, dated Feb. 16, contained a short article on "Value of Time—How the Public Can Help Save It." In this there was an illustration of a mule-drawn car and this comment: "'When You and I Were Young, Maggie,' this car stopped anywhere for us." The tenor of the article was that just as people outgrew the stop-in-the-middle-of-the-block horse car, so they have now progressed to a point where they could consider the stop-at-every-corner plan obsolete.

Thus the skip-stop idea was first suggested to the people in a casual manner, in order to interest them and have them discuss it as a possibility before the company unfolded any plan. In this way the company erected a firm foundation for the work that was to follow.

ASKING THE OPINION OF THE PEOPLE

Then came inquiries from the newspapers as to whether the company was seriously considering the skip stop. The company said that it was, and that it would like to know what the people thought of it. To secure this information the accompanying advertisement, emphasizing the time-saving under the skip-stop plan and asking for an expression of opinion from patrons, was published on the front page of every newspaper in Baltimore.

SKIP STOP SAVES TIME

in other cities

Why Not Baltimore?

If the people want to save 5 to 10 minutes on the cars in reaching their destinations we want to help them to do so.

The plan is simply to skip some of the innumerable stops now made and give a form of

EXPRESS SERVICE

It is not contemplated that any person will have to walk more than one block from any present stopping place.

We would like an expression of opinion from patrons of the company.

What Do You Think Of It?

WRITE AND TELL US

UNITED RAILWAYS AND ELECTRIC CO.

SKIP-STOP PUBLICITY — NEWSPAPER ADVERTISEMENT ASKING OPINION OF PATRONS

A great many letters were received in reply to the advertisement. Some persons objected to the plan, but they were in the minority. Nine out of ten writers heartily approved. Some were very enthusiastic, and urged that the skip stop be adopted as soon as possible. On March 16 the company published in *Trolley News* an article entitled: "Skip Stop for Quicker Service—Many Are in Favor of Trying the Plan." This was accompanied by the reproduction of about two dozen of commendatory letters.

To aid in securing the opinion of patrons, the company distributed card ballots, as reproduced herewith, at the meetings of various organizations of business men. In a short time the skip-stop plan had been indorsed by the City Club, the Rotary Club, the Advertising Club, the Northeast Baltimore Improvement Association, the East Arlington Improvement Association, the North Baltimore Improvement Association, the Confederated Improvement Associations of Baltimore County, the Woodlawn Improvement Association, the Hamilton Improvement Association and various others.

CAST YOUR BALLOT TODAY

SKIP STOP PLAN BALLOT

(Place your X mark in box at the right.)

FOR A TRIAL OF THE SKIP STOP PLAN ☐

AGAINST ☐

Comment____________________

Name____________________

Address____________________

SKIP-STOP PUBLICITY—CARD BALLOT DISTRIBUTED AT MEETINGS OF BUSINESS MEN

The vote of the City Club, taken at one of its luncheons, resulted as follows: For skip stop, 161; against, 16. The vote of the Rotary Club was: For, 78; against, 3. The vote of the Advertising Club was: For, 73; against, 0. Representatives of the company visited some of the organizations and explained the skip-stop plan personally to the members. This personal touch helped greatly to foster a kindly feeling toward the innovation.

The public appeared to be very much interested by this time, and it was thought advisable to issue a "skip-stop catechism." Accordingly on April 1 200,000 four-page pamphlets, one of which is reproduced on page 995, were distributed in the company's cars and by other means. This pamphlet, entitled "The Skip-Stop Plan of Street Railway Operation," endeavored in a series of questions and answers to cover every possible point which might arise in the public's mind relative to the skip-stop method of operation. The general idea of the whole scheme of publicity was that "the cards should be laid on the table face up," so that every one would be perfectly acquainted with what the company proposed to do.

PREPARING FOR A TRIAL OF THE PLAN

Having issued this catechism and having learned the sentiment of the community as expressed in letters and by ballots, the company felt it was not only justified in, but definitely committed to, making a trial of the skip stop in Baltimore.

A preliminary general survey of certain lines was followed by a thorough survey to establish skip stops, and it was decided to put the plan into effect on the North Avenue and the Edmondson Avenue lines. Immediately this was announced in *Trolley News* and in the newspapers by advertisement and news articles.

It should be stated that the selection of the two lines named was due largely to the fact that they serve both city and country, one of them passing very close to the business center of the city and actually through the retail shopping district. No stops were eliminated in the business section.

There was a great deal of detail work to be done, including the marking of poles to show stopping places and non-stopping places. This in itself required a small army of painters, as it was necessary to do this within a very few days in order that there should be no confusion in the public's mind concerning the date upon which the plan was to go into effect.

In announcing April 15 as the date of beginning skip-stop operation, much literature was prepared and distributed in the cars. The following announcement was published in *Trolley News:*

> On Sunday, April 15, Baltimore will have its introduction to the modern skip-stop method of street railway operation, which has been found to work so successfully to the public's good in other large cities.
>
> The effect of the skip stop is to save time for the riding public. To-day, as never before, time is valuable. The saving of five minutes on a trip is of great importance. Wherever there has been progress it has been with the aid of saved minutes.
>
> Saved minutes on each car's run enable that car in the course of a day to make other runs, so the public gets better service as well as faster service.
>
> The lines upon which the plan goes into effect April 15 are the Edmondson Avenue and the North Avenue lines. The company asks the public to give the plan a fair and unprejudiced trial. The stopping places have been selected with a great deal of care that they might be those that would best cater to the public convenience.
>
> The man who has to walk a block farther than heretofore should not lose sight of the fact that he is even then saving many minutes on his trip to his destination.
>
> Poles nearest the present stopping places all along the two lines have been marked. Those at which the stops are retained are painted "CAR STOP."
>
> Since all stops are to be retained in the down-town district it has not been necessary to mark any poles.
>
> Those which are skipped are painted "NO CAR STOPS."
>
> Watch for the white painted poles with the black lettering and there need be no confusion.

SKIP-STOP PLAN

Will Be In Effect On

EDMONDSON AVENUE & NORTH AVE. Lines

Sunday, April 15, and Thereafter

List of stops and non-stops will be printed in this paper Saturday, April 14, and in TROLLEY NEWS.

The Company bespeaks the co-operation of the Public in making a success of this plan for better and quicker service, and asks that it be given a fair and unprejudiced trial.

United Railways & Electric Co.

SKIP-STOP PUBLICITY — NEWSPAPER ADVERTISEMENT ANNOUNCING TRIAL OF PLAN

The same issue of *Trolley News* contained a list of the stops and non-stops on the two lines, and the little folder concluded with this significant suggestion: "The biggest factor in making this movement for quicker and better service successful will be the co-operation and assistance of the progressive public-spirited citizens of this community."

The advertisement shown above was printed in all the daily papers for several days before the beginning of skip-stop operation. Large cards bearing a similar announcement were posted in the cars of the whole system. Other car cards that were used are shown in the illustration on page 992. Besides those reproduced, there were similar cards used on the cars of lines interlacing the two skip-stop lines for short distances.

On the day before the plan was put into operation the company advertised the entire list of stops and non-stops on the front pages of all the local newspapers.

Then the skip-stop plan went on trial.

ONLY OPPOSITION WAS SELFISH

The company awaited the riding public's verdict. It felt that it had exhausted every effort to acquaint its patrons fully with the plan and its purposes, and it was extremely gratified at the favorable expressions of opinion that had followed the suggestion of the idea. But how would the people take the skip stop in actual practice?

Several days passed and only favorable comment was heard. Patrons of the lines spoke in the most glowing terms of the bettered service, and persons using other lines asked that skip stop be applied to these.

As expected, however, some objection was soon raised. Many letters were sent to the company, and many to the Public Service Commission, and still others to the newspapers, "roasting" the skip stop. The company was charged with sins conceivable and inconceivable. Its motives were assailed and its integrity questioned.

The basis of the complaints? In almost every case it was the fact that the writer objected to walking one block to get his car. Out of 174 objecting persons 122 indicated that they were not opposed to the skip-stop principle, but seriously resented "their" corner being skipped. Almost every one of these suggested, either directly or by inference, that he would accord the plan his support if his corner was restored as a stop and the other fellow's corner, a block away, was cut out.

Quicker Service

Better Service

North Ave. Line

	Woodlawn-Washington St.	Walbrook-Milton Ave
Former running time, round trip.......	102 Min.	70 Min.
Skip-Stop time.....	90 Min.	60 Min.
Saving in time...	12 Min.	10 Min.

Edmondson Ave. Line

	Electric Pk. to Luzerne St.	Windsor Hills to Loney's Lane
Former running time, round trip.......	120 Min.	108 Min.
Skip-Stop time....	106 Min.	96 Min.
Saving in time...	14 Min.	12 Min.

On a round trip from Electric Park to Charles and Saratoga Streets there is A SAVING OF 10 MINUTES.

On a round trip from Liberty Heights Avenue to Charles Street and North Avenue, there is A SAVING OF 8 MINUTES.

SKIP STOP

A SUCCESS

SKIP-STOP PUBLICITY — ADVERTISEMENT USED THREE DAYS AFTER OPERATION BEGAN

CONTINUING THE PUBLICITY WORK

In the meantime the company's publicity work was continuing. During these days the management endeavored to show by figures and statements based on actual operating results how the public was being benefited by the skip-stop operation on the two lines.

Three days after the plan became effective the accompanying advertisement was used to show the time saving under skip-stop operation. Cards giving the same figures were placed in the cars, and after these the general card shown in the middle of the group on page 992 was used.

At intervals of two or three days other advertisements were used. One of the first of this series, for example, included the following introduction:

> *MILLIONS OF MINUTES SAVED*
>
> The skip-stop method of street railway operation has been in effect on the North and Edmondson Avenue lines of the United Railways eight days. It has proved successful in giving the patrons of the two lines a quicker and a better service, and these patrons have signified in letters to the company, in telephone messages and in personal conversation their hearty approval of the new and improved running schedules.
>
> On these two lines approximately 125,000 persons are carried every day, so that in eight days about one million passengers have enjoyed the benefits of the skip-stop plan. Millions of minutes of valuable time has been saved them.

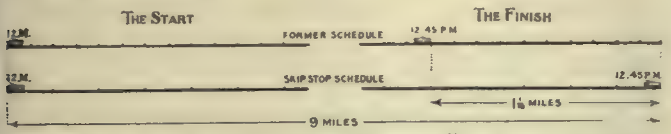
Then came advertisements headed: "People Approve—Its Advantages Are Obvious," etc. A brief introduction sufficed for each of these, the body of the advertisement being letters of commendation received by the company.

HOW "TROLLEY NEWS" SUMMARIZED THE RESULTS

Two weeks after the plan went into effect *Trolley News* contained an article on "What Has the Skip Stop Accomplished?" This contained the following statement:

> Baltimoreans have had an opportunity to see the skip stop in actual operation for two weeks.
>
> In this period about two million passengers have been carried on the two lines. There have been a few objections, but the number of persons who are pleased by the quicker and better service seem far to outweigh those who have not yet come to a realization of the benefits of the plan, but who at present object because they are personally inconvenienced by having to walk a block.
>
> Of the many who are heartily in favor of the skip-stop plan a considerable number have written the company commending the improved service and testifying to the good results it has accomplished.
>
> Patrons of the line who have benefited by the change in the system of operation declare they would consider it a real hardship to return to the old method through which much more time was consumed in journeying from point to point.

This issue of *Trolley News* also contained an illustration graphically portraying the advantage of the skip stop. With its accompanying explanation it is reproduced herewith.



SKIP-STOP PUBLICITY—"TROLLEY NEWS" GRAPHIC REPRESENTATION OF TIME SAVING

> The accompanying illustration very graphically presents the saving of time by the skip-stop plan.
>
> Here are shown cars leaving a terminal under the old schedule and under the new skip stop.
>
> They start at the same hour, noon, and have to run the same distance, nine miles.
>
> At 12.45 the skip-stop car has reached its destination.
>
> At 12.45 the old schedule car has still more than a mile to run to its destination. It will be six minutes later before it reaches the point at which the skip-stop car has already completed the run.

PUBLIC IS BETTER SERVED

Since Baltimore has been trying the skip stop, representatives of the United Railways & Electric Company have visited many organizations which were interested in the subject, and have explained the plan and answered questions concerning it. The attitude of some of these organizations was not altogether favorable at the beginning, but it has been found that when the matter was properly presented to a body of reasoning men the chances were largely in favor of their appreciating the advantages of the plan, and of our winning their indorsement and support.

TROLLEY NEWS

SKIP STOP

To Go Into Effect On Two Lines

THE SKIP STOP PLAN
OF
Street Railway Operation

1 *Question. What is the Skip Stop plan?*

Answer: It is a plan to fix certain corners as stopping places for the cars, and to skip the other corners.

2. Q. *Does it provide for skipping every other corner?*

A. No.

TROLLEY NEWS

What Has The Skip Stop Accomplished?

SKIP-STOP PUBLICITY—EXAMPLES SHOWING HOW "TROLLEY NEWS" HELPED TO EDUCATE THE PUBLIC—IN THE CENTER IS THE SKIP-STOP CATECHISM

Briefly summarized, the advantages of skip-stop operation are manifest through a perusal of the advertisement printed on page 994, which shows the saving of time. Forty-five more round trips per day are being made on the two lines, with an added mileage exceeding 500 miles. And with this our figures show there is a saving in cost of operation.

It has been proved that the public is better served, and that while giving a better and a quicker service the company can save its energy and equipment.

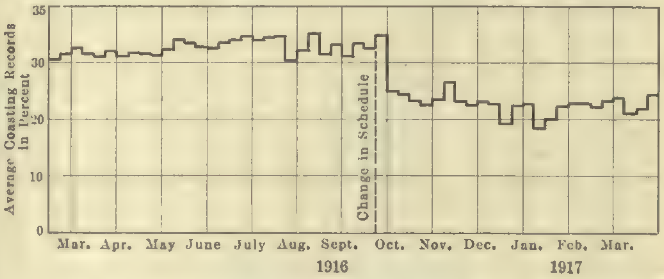
Whether or not the skip stop, which the United Railways & Electric Company regards as a distinct advance in modern railway operation, is to be a permanency in Baltimore, it is felt that the company has presented a trial to the people under the fairest terms possible.

Coasting Recorders at Fort Worth

Point the Way to Higher Schedule Speed—Five Cars Do the Work of Six

ALTHOUGH coasting is usually considered chiefly from the economies it effects in energy and brakeshoes, intelligent analysis of the coasting records can lead to still greater benefits. A recent example is afforded by the Northern Texas Traction Company, which has all of its cars equipped with Rico coasting recorders.

This company operates in Fort Worth the Polytechnic-Belknap line, whose round trip length is 12.28 miles.



COASTING PERCENTAGES ON POLYTECHNIC-BELKNAP LINE BEFORE AND AFTER SCHEDULE SPEED WAS INCREASED

The headway is fifteen minutes. In analyzing the coasting records, it was observed that the average performance of all men was about 33 per cent and the maximum above 35 per cent. Roadway conditions were such that some of this slack in the line could be taken up by using a higher schedule speed to such advantage that one of the six cars could be eliminated.

The change was made on Oct. 1, 1916, the schedule speed being raised from 8.19 m.p.h. to 9.82 m.p.h., or 16 2/3 per cent. This cut the round trip running time from ninety minutes down to seventy-five minutes, or seven and a half minutes each way.

Thus the company not only gets five cars to do the work of six, but also makes travel more attractive. While the coasting percentage now ranges from 24 per cent average to 26 per cent maximum, the actual energy and brakeshoe savings will probably be greater since there are only five cars to run instead of six.

The E. H. Harriman memorial medals have been awarded by the American Museum of Safety as follows: The gold medal to the Alabama Great Southern Railway, Cincinnati, Ohio; the silver replica to the Illinois division of the Illinois Central Railway, Chicago, Ill.; and the bronze replica to James A. McCrea, general manager Long Island Railroad, New York, N. Y.

New Kansas Interurban Line Serves Central Cities

Arkansas Valley Interurban Railway, Connecting Wichita, Hutchinson and Newton, Forms Central Section of Contemplated Extensive System

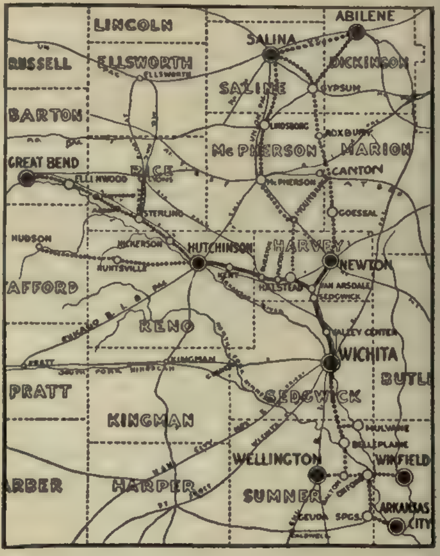
THE final section of an interurban line, connecting Wichita, Newton and Hutchinson in the central part of Kansas, was completed last year and through service has been inaugurated between these points. The property comprises at present a total of 62.8 miles of electric railway, serving an unusually rich section of the Arkansas River Valley. At the Hutchinson end of the line there is a population of 20,000, and enormous salt production, soda ash manufacturing and flour mill industries. At Wichita, the present south terminus of the line, the milling, packing and stockyard industries flourish and there is here a population of 70,000. The first section was built from Wichita to Halstead, a town of only 2500 population, and the following year the branch into Newton, a town of 8000 inhabitants, was completed. The final construction was the section from Halstead to Hutchinson. When this began operation the passenger traffic increased 100 per cent almost immediately and the earnings reached an amount for the first time which left some surplus above operating expenses.

OPERATING FIGURES SHOWING EFFECT OF COMPLETION OF LINE INTO HUTCHINSON IN 1916

	1912	1913	1914	1915	1916
Gross earnings	$136,442	$132,546	$137,454	$140,261	$271,107
Operating expense ...	86,702	79,756	79,612	82,150	140,684
Net earnings	$49,740	$52,790	$57,842	$58,111	$130,423
Interest and taxes...	47,965	53,553	58,387	59,691	83,222
Net revenue	$1,775	*$763	*$545	*$1,580	$47,201

*Loss.

Further extensions of the system are definitely contemplated, and President George Theis, Jr., states that the proposed extension to the north to the cities of Salina and Abilene will be constructed just as soon as materials prices return to somewhere near normal. Later extensions to the south and west are contemplated, looking toward a comprehensive system to serve the agricultural, manufacturing and oil industries of this rich section.



Interurban lines now operating and under construction.
Interurban lines proposed.
Railroads.

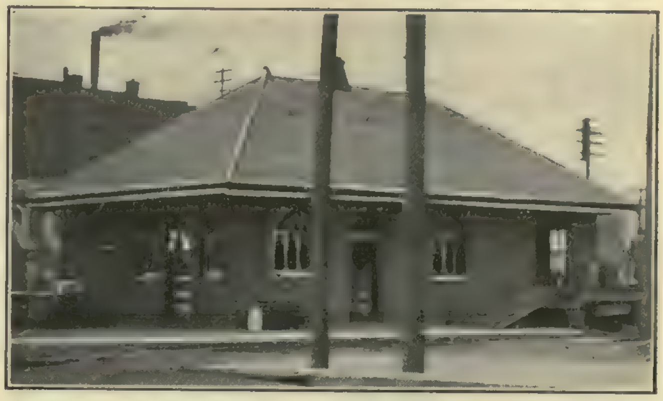
NEW KANSAS INTERURBAN—MAP OF PRESENT AND PROJECTED LINES

Owing to the level character of the country through which the line runs very little difficulty was encountered in its construction. It is on a private right-of-way, varying in width from 66 ft. to 100 ft., with a roadbed 16 ft. wide on top and sloping ½ in 1 on fills and 1 in 1 in cuts. The maximum curvature on private right-of-way is 6 deg., and the maximum grade of 1½ per cent is encountered at an overhead crossing with the Santa Fé Railroad near Newton. The maximum curvature on the newer Hutchinson end of the line is 2 deg. The rail on this end of the line is 80-lb. and 85-lb. A. S. C. E., while that on the older section at the Wichita end is 70 lb. At present approximately 20 miles of the line is ballasted with 6 in. to 10 in. of gravel ballast from a pit on the company's right-of-way, but the entire line is well ditched on either side of the track so that there is excellent drainage and the track has remained in unusually good condition for non-ballasted road. The rails are laid principally on 8-ft. x 6-in. x 7½-in. oak ties and the joints are bonded with No. 0000 twin-terminal bonds in open track and crown bonds in the city streets. Cross-bonding between rails is installed at all lightning arresters. These arresters are of the Garton-Daniels type installed every 990 ft. on the overhead pole. Duquesne rail joints were used on the Hutchinson end of the line, while angle bars were used on the earlier construction.

Temporary wood structures were installed in the original construction work, but are being replaced as rapidly as possible with permanent concrete bridges.

NEW KANSAS INTERURBAN—BURTON DAYLIGHT SUBSTATION

NEW KANSAS INTERURBAN—HUTCHINSON TERMINAL STATION


NEW KANSAS INTERURBAN—NEWTON TERMINAL STATION

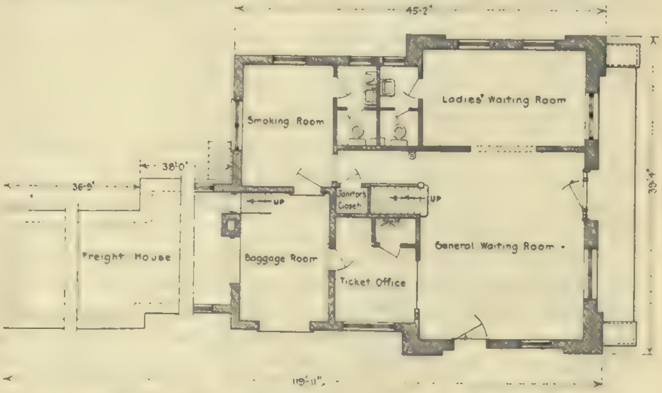
Ten of these have already been completed and the abutments for four more installed. This will leave only four wood trestles on the entire property. The longest concrete bridge, shown in an accompanying photograph, is 240 ft. long. There are two trestles 230 ft. in length which probably will not be replaced this summer.

OVERHEAD CONSTRUCTION AND POWER SUPPLY

Energy for the operation of the line is purchased entirely from the Kansas Gas & Electric Company at Wichita, except for 7½ miles out of Hutchinson, where the supply is direct current without transformation from the power plant of the United Water, Gas & Electric Company in Hutchinson. There has been constructed a 66,000-volt, 60-cycle, three-phase line along the right-of-way to supply the three railway substations, one at Valley Center, 10 miles from the Wichita power house, the second at Van Arsdale Junction, 13.5 miles beyond the first, and the third at Burrton, 14 miles beyond the second. The electric company maintains its line and sells energy to the railway company metered on the 2300-volt side of the transformers in the substations.

The high-tension circuit of the electric company is carried on Idaho red cedar poles adjacent to the tracks, and the brackets for the railway overhead construction are mounted on these same poles. The No. 0000 trolley is paralleled over much of the line by one or two No. 0000 feeder cables which are carried on the lower crossarms on the high-tension poles. The railway company's telephone circuits are also installed on these crossarms. The overhead fittings and insulators are of Ohio Brass Company manufacture throughout. From Halstead west the trolley is insulated for a pressure of 1200 volts, looking toward the ultimate operation of the entire system at this voltage instead of 600.

The Valley Center and Van Arsdale Junction substations are equipped with Allis-Chalmers motor-generator sets, with one 200-kw. unit and one 300-kw. unit in the former and two 300-kw. machines in the latter. These substations are of the usual type of construction. Living quarters are provided on the second floor for the station operator and family, and outdoor high-tension switching equipment is used. The newer Burrton substation on the Hutchinson section of the line is rather unusual, its construction being almost entirely of glass.



NEW KANSAS INTERURBAN—FLOOR PLAN OF HUTCHINSON STATION

This is called a "daylight-type" substation. In this case a four-room cottage at the rear is furnished for the use of the operator and his family. The front end of the substation is partitioned off to make a waiting room for passengers. This substation is equipped with one 200-kw. and one 300-kw. General Electric motor-generator sets, and the high-tension switching apparatus, also of the outdoor type, is installed at the rear of the substation.

An unusually attractive terminal station in Hutchinson has recently been completed. This is a two-story dark red tapestry brick building with waiting rooms

NEW KANSAS INTERURBAN—FREIGHT AND GENERAL OFFICE BUILDING AT WICHITA

NEW KANSAS INTERURBAN—TYPICAL CONCRETE BRIDGE AND PASSENGER CAR

for men and women, baggage room, smoking room, ticket office, etc., on the first floor, and offices on the second floor, which at the present time are rented out to another company. At the rear of the station is a long, narrow express and freight shed, which is constructed with brick columns and with the sides closed off by seven Kinnear rolling steel doors on either side, and one at the extreme end. This long, narrow platform, with the cars on one side and teamway on the other, makes possible the handling of freight and express with a minimum of labor.

NEW KANSAS INTERURBAN—VAN ARSDALE JUNCTION SUB-STATION AND OUTDOOR SWITCHING EQUIPMENT

Two types of small shelters have been erected at the principal cross-road stops along the line. In one of these the partitions are placed in a right-angle cross and set at an angle of 45 deg. to the track. These are constructed of wood with shingle roof and cost approximately $70 each. The other type of shelter used is built in the form of an H, with seats installed on either side of the crossbar. These were also made of single-board partitions with shingle roof and erected at a cost of $30 each.

NEW KANSAS INTERURBAN — TYPE OF SHELTER USED ALONG LINES

TRAFFIC POSSIBILITIES

The property is equipped with various freight and express cars for handling l.c.l. and carload business. While this is not developed to any extent at the present time, it is expected that arrangements will be completed in the near future which will place the company in position to haul a considerable quantity of the north and south freight movement through this district. Through its connections the line taps the principal wheat-producing territories of the State, which in 1914 raised and shipped 335,000,000 bu. of wheat. The flour mills of Wichita produced 1,750,000 bbl. of flour last year, and more than 50,000,000 lb. of salt were shipped from the State of Kansas in 1916, more than from any other state in the Union. Some of the carload freight from the soda-ash manufacturing plants at Hutchinson, which is one of the largest in the country is also expected to move in a southerly direction over the electric line. Franchise rights have been secured for a private right-of-way entrance into Wichita, which will cut down the running time within the city from ten to fourteen minutes, and also make possible certain interchange connections with steam railroads and provide for the hauling of carload freight.

Fare Case to Be Reopened

Bay State Street Railway Is Compelled by Rapidly-Increasing Costs to Ask Further Relief Before End of Trial Period

Seeking the reopening of its fare case on behalf of the establishment of a 6-cent unit throughout its entire system, the Bay State Street Railway appeared before the Massachusetts Public Service Commission on May 25. S. H. Pillsbury and S. E. Wardwell represented the company, and a numerous array of counsel registered on behalf of municipalities in the company's territory. Features of the hearing were the testimony of C. R. Rockwell, treasurer; H. F. Fritch, statistician, and R. S. Goff, vice-president and general manager, bearing upon the company's imperative need of additional revenue. As the result of the testimony presented, the commission has decided to reopen the case.

In opening the case, Mr. Pillsbury stated that since the rate decision on Aug. 31, 1916, which in general authorized a 6-cent fare on country but not on city lines, the company had done its best to put into effect the recommendations of the board with respect to securing greater economy of operation, as far as this could be effected without additional capital expenditure. Special attention had been given to the recommendations in the report of B. J. Arnold to the commission pointing out ways in which further economies might be attained. Rapidly-increasing costs, however, averaging more than 66 per cent in representative materials since 1914, the burdens of higher wages and poor credit had led the company to ask for a reopening, despite the intimation of the board in the 1916 finding that such action would not be taken until a year's trial of the rates then authorized had been made.

Mr. Rockwell said that the company is now in a position where it cannot market new securities, a 6 per cent $2,000,000 note issue having failed in December, 1916. In the year ended June 30, 1916, the net operating revenue decreased 15.97 per cent as compared with 1914, and for the nine months ended March 31, 1917, it decreased 19.64 per cent from the net of the corresponding period in 1914. The year 1914 was the one whose figures were used by the commission as the basis for its decision in the rate case of 1916. The 1916 operating expenses were 14.16 per cent greater than in 1914, and for the nine months' period ended March 31, 1917, they were 27.04 per cent greater than for the corresponding 1914 period. Gross earnings increased but 3.97 per cent in 1916 over 1914, and 11.9 per cent in the 1917 nine months' period. Net income was 37.68 per cent less in 1916 and 52.86 per cent less in 1917, compared with 1914.

The witness then introduced the table on page 999 showing the increased cost of about thirty important items of material used by the equipment, operating, line and track departments since 1914. The table shows the approximate average annual consumption of each class of materials used, the total costs being those figured upon the assumption that the company had purchased these average amounts in the periods named. Other items not listed, according to the company's purchasing agent, show about the same general run of increases, the tabulated items being typical and not specially selected to emphasize the rising costs.

Mr. Rockwell said that the increase in wages since Sept. 30, 1914, was due to an arbitration award effective from Oct. 1, 1914, to Sept. 30, 1916, and to a working agreement dated Oct. 1, 1916, and running to May 1, 1920, with successive increases between those dates. The total additional wage cost from Oct. 1, 1914, to May 1, 1917, over the 1914 rates, if no allowance is made for increased service, was $855,600. The increased cost per year, after May 2 last, with no allowance for increased service, compared with 1914, is $768,000. Touching upon the coal situation, Mr. Rockwell said that the advantageous contracts of the company are now expiring. About 20,000 tons are on hand, or one-eighth of the year's requirement. The recent and prospective coal cost of the company, which calls for more than double the outlay of 1917 for 1918, is shown below for the years ended June 30, 1914, to 1918:

1914, at $3.70 per ton	$601,000
1915, at 3.55 per ton	583,000
1916, at 3.80 per ton	618,000
1917, at 4.55 per ton	728,000
1918 (estimate)	
35,000 tons, at $7.50 per ton	$262,000
125,000 tons, at $10 per ton	1,250,000
160,000 tons	$1,512,000

Mr. Fritch stated that since the decision of the commission last summer a complete traffic study had been made for the entire system. About 25 per cent of the stops had been eliminated. In some cases service had been curtailed along lines suggested by the board, and about $90,000 per year was being saved in this way. The recommended changes, however, which call for capital outlay had been deferred on account of the lack of funds. These involved the purchase of new special and other track work in particular. The company had purchased a one-man car which would shortly be placed on trial service, and was rebuilding another single-truck car for one-man service. Service had been discontinued on the Lynn (Mass.) belt line, and the abandonment of certain other track was under consideration.

Mr. Goff said that he had been specially assigned to apply as many of the Arnold recommendations as possible to the economical operation of the road. The repair force had been largely increased and the reconstruction of 200 cars for prepayment service had been undertaken in the company's shops. About 50 per cent more cars had been painted in the fall than in the corresponding period a year ago. The rising cost of labor and materials, however, had increased the estimated cost of remodeling per car from an $800 base to $1,200 in sixty days. This meant that the cost of rebuilding would be $240,000 instead of $160,000. When the company found itself unable to issue new securities last winter, it became necessary to suspend the work, after thirty-seven cars had been completed. In part the car shortage had been met by equipping open cars with canvas curtains and electric heaters, and running them express to and from munition and other war material plants in the rush hours. Mr. Goff said that the problem of transfers was being studied with reference to the one-man car. The concentration of shop and carhouse facilities recommended in the Arnold report, he remarked, had been impracticable under the financial condition of the company.

APPROXIMATE COST OF MATERIALS USED DURING CALENDAR YEARS 1914, 1915 AND 1916 AS COMPARED WITH THE COST AT THE PRICES OF MAY 1, 1917

Material	Approximate Annual Consumption	Approximate Costs for Years			1917	Per Cent Increase from 1914
		1914	1915	1916		
Equipment Department						
Axles	250	$3,980	$3,989	$5,689	$8,000	101.01
Babbitt	65,000 lb.	20,000	21,300	25,185	33,300	66.50
Brakeshoes	35,000	14,000	12,250	12,250	20,825	48.75
Car wheels, iron	5,000	18,750	18,750	21,250	37,500	100.00
Glass	1,600 boxes	6,096	7,080	9,024	12,640	107.35
Magnet wire	175,000 ft.	28,437	33,906	55,344	64,750	127.70
Machine steel	200 tons	6,400	7,840	12,960	19,400	203.13
Register cord	175,000 ft.	3,193	3,325	4,243	5,338	67.20
Segments	300 sets	6,543	6,615	8,265	14,064	114.95
Tape, insulating	18,500 lb.	3,615	3,615	3,700	5,010	38.60
Trolley wheels	8,500	5,525	5,525	6,460	9,435	70.77
Waste	70,000 lb.	3,066	3,430	5,250	7,000	128.32
White lead	16,000 lb.	1,040	1,028	1,350	1,680	61.60
Operating Department						
Salt	10,000 bags	8,000	8,200	8,600	9,400	17.50
Line Department						
Feeder wire	75,000 lb.	10,256	13,567	20,647	27,000	163.27
Pole paint	2,000 gal.	1,740	1,740	1,820	2,100	20.70
Poles, chestnut	2,500	14,547	15,667	17,974	19,112	31.38
Poles, steel	300	4,950	5,346	5,830	15,620	215.56
Span wire	525,000 ft.	3,591	3,808	5,342	6,510	81.30
Splicing sleeves	1,800	1,620	1,575	3,105	3,510	116.70
Trolley ears	20,000	3,075	3,400	4,700	5,400	75.62
Trolley wire, 97 per cent	85 miles	25,650	32,094	52,920	66,600	159.65
Track Department						
Bonds	30,000	21,150	25,248	28,710	37,200	75.89
Channel plates	115 tons	5,106	5,106	5,106	9,016	76.58
Paving blocks	400,000	24,000	22,600	22,700	27,200	13.34
Rails, tee	700 tons	19,600	19,600	19,600	28,000	42.86
Rails, girder	2,500 tons	97,000	97,000	97,000	134,500	38.66
Spikes	1,800 kegs	5,400	5,044	7,200	13,860	156.70
Track bolts	700 kegs	4,200	4,025	4,480	11,550	175.00
Ties	150,000	94,500	94,500	94,500	112,500	19.05
Tie rods	25,000	8,058	6,712	10,000	20,000	148.21
Total		$473,088	$493,885	$581,204	$788,020	66.57

Mr. Goff said that studies of the Maplewood, South Braintree and Somerset carhouses show that the advantages of consolidating the service of these stations with that of other operating centers appear insufficient to warrant the change, despite the intimation of the Arnold report that substantial economies could be obtained by reducing the number of operating houses. The desirability of installing additional feeders is recognized by the company, but with copper at 38 cents per pound the purchase of wire beyond absolutely necessary requirements is prohibitive. Glen Forest Park, Lawrence, has been sold and other parks have been put up for sale, but the market for this class of property is at present unsatisfactory.

Regarding the 6-cent fare on the country lines, Mr. Goff said that this has fairly met expectations with regard to increasing revenue. On the Gloucester lines, the best territory of this class, there was a 12.8 per cent increase in revenue in a recent three months' period. Taunton showed about the same increase, and on the Woburn lines the gain was 8 per cent. The abolition of tickets in Fall River, resulting in the establishment of a 5-cent fare in place of the former six tickets for 25 cents, has not resulted in any permanent decrease in traffic. The jitney menace in Fall River, the witness said, has mainly subsided into a cab service at higher rates. Jitneys operating between New Bedford and Fall River charge relatively high fares. About $300,000 a year, however, it is estimated, is lost by the company through jitney competition. Closing, Mr. Goff said that the company may have to curtail service next winter on account of the fuel situation. About 120 men have been dropped from the maintenance department, and only work necessary for safety is being done at present. The company has endeavored to economize in all possible ways, and needs about $2,000,000 additional annual revenue.

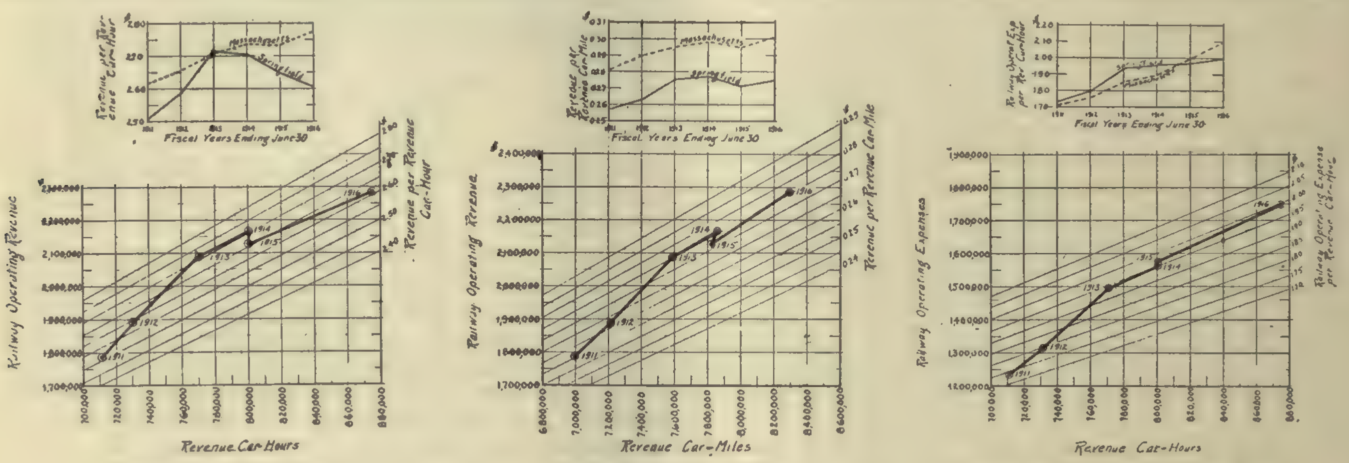
The subway system of the Interborough Rapid Transit Company, New York, N. Y., has carried 2,958,200,205 passengers, about twice the population of the world, in ten years. Each year it carries more than a third of the total number of passengers carried on all the railroads of the United States. Only one passenger has been killed in a subway train accident in ten years.

Springfield Company Wants 6-Cent Fare

Need of Massachusetts Company Explained by President Wood at Board of Trade Meeting —Professor Richey in Special Report States That Revenues Must Be Increased in Some Way

A 6-CENT FARE as the alternative to bankruptcy or public ownership faces the Springfield (Mass.) Street Railway, according to a statement of President C. V. Wood at a Board of Trade meeting on May 24, attended by local city government officials and prominent business men. Mr. Wood said that in the near future a petition on behalf of a 6-cent fare unit will be filed with the Massachusetts Public Service Commission.

During the meeting there was a discussion of a report just completed by Albert S. Richey, professor Worcester Polytechnic Institute, upon street railway traffic conditions in Springfield. Professor Richey, as stated more in detail later, predicted that increased fares must come if needed improvements are to be made and a reasonable return is to be paid upon the investment at present made and authorized.



Revenue per Car-Hour Revenue per Car-Mile Operating Expense per Car-Hour

FIG. 1—SPECIMEN CHARTS USED TO EMPHASIZE OPERATING DATA

GENERAL STATISTICAL DATA

According to Professor Richey's report, the expenditures of the Springfield Street Railway for the fiscal years ended June 30, 1911 to 1916, inclusive, increased from about $1,800,000 in 1911 to $2,300,000 in 1916, this increase being gradual and constant except that the amount for 1915 is less than that for 1914. In the four years (1912-1915) which showed a surplus, it was in each case considerably under 1 per cent, the maximum being in 1913 and amounting to 0.61 per cent of the total expenditures. The deficit in 1911 amounted to 0.37 per cent and in 1916 to 1.23 per cent of the total expenditures.

The operating expenses, amounting to a little more than $1,200,000 or 68.6 per cent in 1911, increased steadily until in 1916 they amounted to about $1,750,000 or 75.5 per cent of the total expenditures. Maintenance of way and structures fluctuated between a maximum of a little more than 11.2 per cent in 1912 to a minimum of 7.1 per cent in 1916. Maintenance of equipment showed its smallest percentage value in 1914, when it was 8.7 per cent, and its largest in 1913 and 1916, when in each case it was 11 per cent. The total of the two maintenance accounts is at present slightly more than 18 per cent, having been at the maximum in 1913, at which time it was 22 per cent.

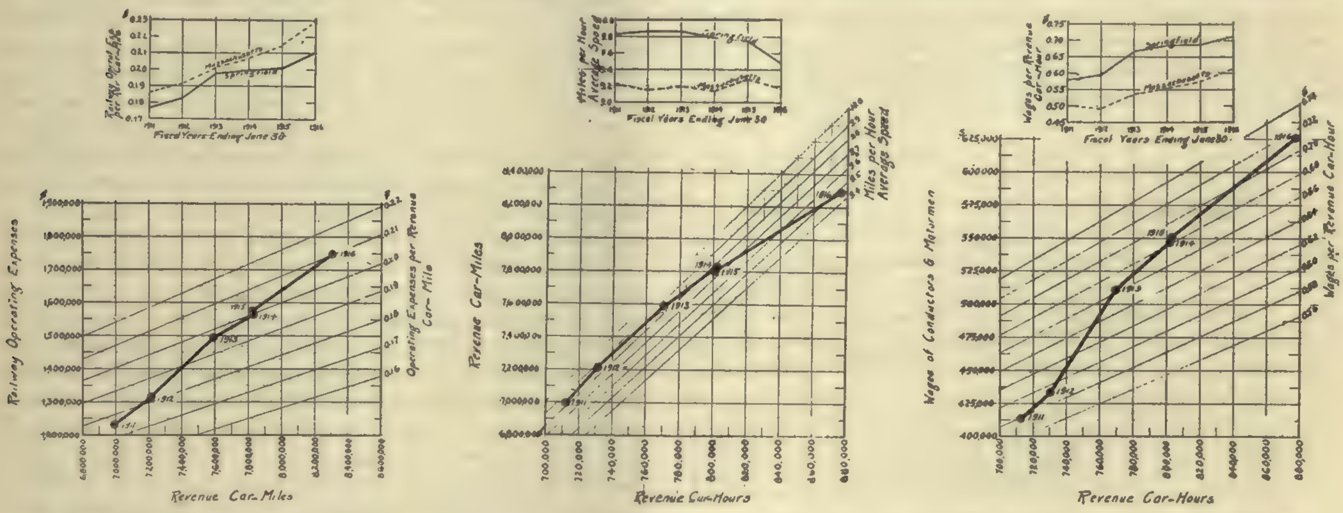
The amount expended for power ranged from 11.3 per cent in 1913 to 13.6 per cent in 1915. The 1916 expenditure for power was 12.2 per cent of the total expenditures. The cost of conducting transportation showed a most steady increase, not only in the amount expended but in the per cent of total expenditures. During the six-year period in which the total receipts of the company increased about 28 per cent, the expense of conducting transportation increased about 56 per cent, and the percentage of receipts paid out for conducting transportation increased about 20 per cent. In 1911 and 1912 less than 27 cents of each dollar of receipts was spent for this item, and in 1916 more than 32 cents.

The general and miscellaneous expenses ranged from a minimum of 9.4 per cent in 1913 to a maximum of 12.7 per cent in 1916. The average percentage is about the same as that of other railways in Massachusetts, excluding the Boston Elevated Railway. Taxes varied from 9.4 per cent of the gross in 1911 to 5.4 per cent in 1916. The average for all Massachusetts street railways, except the Boston Elevated Railway, is about 6 per cent for the six years, 1911 to 1916. The return on investment, consisting of interest and dividends, was $396,433 in 1911 and $443,864 in 1916. The sum is equivalent to 22 per cent of the total expenditures in 1911 and 19.2 per cent in 1916.

CHARTS SHOWING OPERATING DETAILS

Fig. 1 and Fig. 2 contain charts which illustrate those prepared by Professor Richey to emphasize various operating data. The "revenue per car-hour" chart shows that the number of car-hours operated was increased at a slower rate than the revenue for the first three years considered, while for the last three years more car-hours have been operated than were warranted by the increase in revenue. The small chart above indicates that only in 1913 did Springfield have as high a revenue per car-hour as the rest of the State. In 1916 the Springfield revenue per car-hour had become 6 per cent less than for the rest of the State. The "revenue per car-mile" chart shows that evidently an effort has been made to adjust the car-miles run to the business. In 1913, 1914 and 1916 the revenue per car-mile was practically the same at about 27½ cents. The revenue per car-mile in Springfield was from 2 to 2½ cents less than in the rest of the State throughout the whole period.

The "operating expenses per car-hour" chart shows that for the last four years this item has been held fairly uniform, being $1.94 in 1913 and about $2.00 in 1916. The Springfield operating expense per car-hour was from 2 cents to 8 cents higher than for the State until 1914, but a few cents lower for the succeeding two years. The "operating expense per car-mile" chart points out that the operating expenses are increasing faster than the car-miles, but at about the same rate as for the State. From the "car-miles per car-hour" chart a slight increase in speed will be noted between 1911 and 1912, that of the later year being nearly 9.9 m.p.h. It has been steadily falling off, however, until in 1916 the average speed was less than 9.5 m.p.h., the greatest decrease being between 1915 and 1916.



Operating Expense per Car-Mile — Car-Miles per Car-Hour — Wages of Conductors and Motormen

FIG. 2—ADDITIONAL CHARTS USED TO EMPHASIZE OPERATING DATA

The "wages of conductors and motormen" chart shows the wages per car-hour increasing from 58 cents in 1911 to more than 71 cents in 1916. The average wage paid to the individual conductor or motorman was one-half of that amount, namely, 29 cents per hour in 1911, increasing to nearly 36 cents per hour in 1916. This represents an increase in wages per hour, time actually worked, of nearly 25 per cent between 1911 and 1916. This, it is said, is probably the highest average rate per hour paid to conductors and motormen of all street railways in Massachusetts or New England. The wages per car-hour in Springfield were 8 cents greater than those for the State in 1911 and 10 cents greater than those for the State in 1916. In other words, the average individual conductor or motorman in Springfield is now receiving 5 cents per hour more than elsewhere in the State, excluding Boston.

TRAFFIC SURVEY AND SERVICE STANDARDS

A comprehensive survey of the movement of cars and passengers in the first 5-cent fare zone (Springfield Division) was made during the period from Jan. 22 to Feb. 13, 1917. The principal items of information obtained through this survey have been plotted by routes and form a separate volume of 350 pages as a supplement to Professor Richey's report.

In the present consideration of data from the traffic survey, the proper total capacity of the Springfield cars is considered to be 75 per cent in excess of the seating capacity during rush hour periods. This allows a total of seventy-seven passengers for the ordinary forty-four-seat car during rush hours. Such a standard, however, should be applied as the average of the number of cars in the same direction on the same route in any one fifteen-minute period for five successive week days, in order to provide against the contingencies of irregular travel.

Fig. 3, prepared by Professor Richey, compares the loading time per passenger of the various types of cars for various numbers of passengers boarding at one loading point, and brings out the fact that, compared with the standard prepayment cars, the cars converted from open cars require from one-quarter to three-quarters of a second more time per passenger in loading. While it might be considered a serious error to purchase new cars with such step and platform arrangement, on account of the considerably longer loading time required, the Springfield Street Railway, it is said, cannot be censured for so reconstructing these open cars, as it makes a large portion of the equipment available for all-year-round use, which formerly was limited to a few months' use each year during the summer season.

All closed cars which have been purchased since 1914 have been equipped with about 65 per cent of the seating capacity in cross seats, so that the passenger faces the front of the car. This is considered to be a more comfortable position for the passenger, but on account of the short haul on many of the Springfield city lines, it is doubtful whether the policy of equipping all cars with so many cross seats is advisable, owing to the fact that such construction materially reduces the available standing area. It would seem that for routes where the haul is short and the rush hour loads large, economy would dictate the use of a car with longitudinal seats throughout its length.

ADEQUACY OF PRESENT SERVICE

Data of a general nature resulting from the traffic survey are included in the table on page 1002. The rush hours between 5.30 and 8.30 a. m. and between 4.30 and 6.30 p. m. comprise only five of the nineteen hours considered in the table, or about 25 per cent of the time. During this period, however, more than 65,000 passengers, or nearly one-half of the total, are handled. The figures indicate a much larger use of the facilities offered during the evening rush hour than at any other period of the day. It shows also the very limited use of the facilities offered during the hours between 8.30 a. m. and noon and after 6.30 p. m. If it were possible

General Traffic Data for Central 5-Cent Zone of Springfield Street Railway

Period	Total Passengers	Total Passenger-Miles	Total Seat-Miles
5.30 a. m.—8.30 a. m.	32,155	82,605	132,958
8.30 a. m.—noon	17,299	41,219	131,106
Noon —4.30 p. m.	34,582	81,771	175,717
4.30 p. m.—6.30 p. m.	33,216	82,474	111,074
6.30 p. m.—12.30 a. m.	32,482	75,290	225,136
Entire day	149,734	363,359	775,991

	Pass. per Hour	Pass.-Miles per Hour	Seat-Miles per Hour	Load Factor, Per Cent	Av. Miles per Pass.
5.30 a. m.—8.30 a. m.	10,718	27,535	44,319	62.2	2.57
8.30 a. m.—noon	4,943	11,777	37,459	31.4	2.38
Noon —4.30 p. m.	7,686	18,171	39,048	46.5	2.36
4.30 p. m.—6.30 p. m.	16,608	41,237	55,537	74.3	2.48
6.30 p. m.—12.30 a. m.	5,414	12,548	37,523	33.4	2.32
Entire day	7,881	19,124	40,842	46.8	2.43

to take service out of these light hours and put it into the rush hours, especially between 4.30 and 6.30 p. m., to the same amount and at the same cost, the net result would be a much improved service.

Especially during the evening rush hours, however, the railway has in service all of its available equipment, so that in order to transfer any car-miles from the slack periods into the evening rush period, it would be necessary to provide additional equipment. Enough additional return must then be earned in the short evening rush hour period to pay not only operating expenses, but the fixed charges incident to the additional investment. Moreover, Professor Richey adds, the evening rush hour service, if increased, must pay a very much larger per cent of operating expenses than is required by non-rush-hour service, owing to the peculiar form of agreement between the Springfield Street Railway and its conductors and motormen.

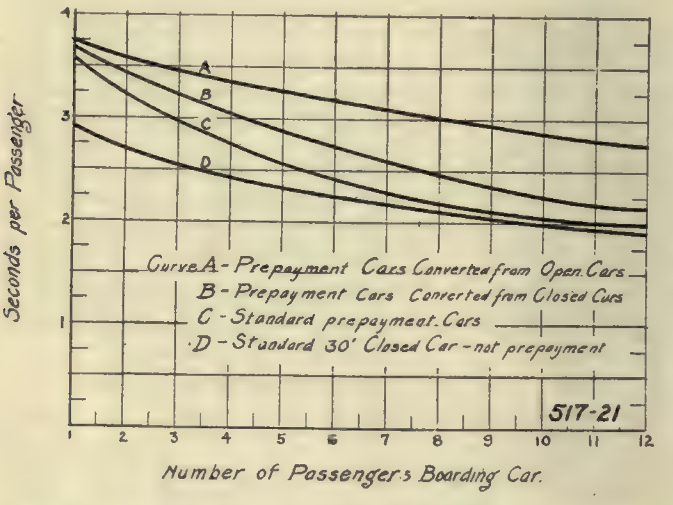


FIG. 3—COMPARATIVE LOADING TIME PER PASSENGER FOR DIFFERENT CLASSES OF CARS

The company's wage scale is on the daily basis, a definite amount being paid for each day, irrespective of the time worked, up to nine hours, after which overtime is paid. On all other roads in the State (and practically all other roads in the country) wages are paid on the hourly basis. The addition of a considerable amount of short rush-hour service in Springfield would therefore mean that the wages of the carmen concerned would amount to three to five times the sum paid for such services per hour during the normal hours. If such short-period cars were operated by men who had already done a day's work on an all-day car, the "intervening time" and overtime required by the wage agreement would likewise make the average wage per hour actually operated three to five times the average normal hour rate. Whatever interchange of service is made, Professor Richey says, must be with due regard to the comparative expense of operation in the two periods.

Various Changes Recommended

In a detailed consideration of routes, Professor Richey makes a number of recommendations relative to decrease of non rush-hour service and increase of rush-hour service. Non-rush service may often be decreased to advantage, he states, by a cutting off of non-productive service furnished to the outer ends of long routes. A large portion of such service might well be converted into service on short-haul routes through the center of the city where jitney competition is most active. It is especially recommended that service in these sections be increased during the evening rush hours. It would then be possible and desirable to operate "express" or "limited stop" cars through the downtown sections concerned, thus more nearly confining the short haul passengers to the short haul cars.

With the present one form of transfer for all lines, Professor Richey says, the privilege may quite easily be misused, either with or without the co-operation of the issuing or receiving conductor. Good practice demands that a separate form be used for each route and preferably a separate form for each direction on each route. A further protection against misuse consists in using a color scheme for transfers issued on cars bound in the same general direction. A considerable reform should also be made in requiring that the time be more accurately punched and that transfers be refused after a certain definite short interval, allowing for use only on the first car of the receiving line.

It is recommended that the spacing of white-pole stopping places throughout the settled residence districts be made to conform as closely as possible to a 400 ft. minimum and a 500 to 600 ft. maximum. Such a campaign would result in the elimination of 20 to 25 per cent of the stopping places. As for jitneys, they should be required to have licenses, and the operators should be bonded. To help in relieving congestion on Main Street, Professor Richey recommends "multiple berth passenger stops" on the near side. When more than one car is stopped at a traffic intersection all passengers should be required to board or alight at the point of stoppage, so that when the signal is given to proceed the cars may proceed without any making a second passenger stop.

The rates of acceleration and braking seem to approximate 1 m.p.h.p.s. in Springfield, being especially low in the Main Street section during rush hours. In this section, however, average rates of 1.50 to 1.75 m.p.h.p.s. should be used, and in other parts of the city it should be possible to use average rates of 2 m.p.h.p.s. At no time should parking of automobiles be permitted opposite the loading places, and during rush hours no automobiles should be permitted to stop opposite such places except at the bidding of traffic officers.

The limit of paying passenger haul on the Springfield division is around 2.75 miles, with the 1916 allowances for return on investment and depreciation. With the proper allowances for these items, the paying haul is in all probability less than 2.25 miles. The average ride for all passengers is 2.43 miles. The average ride of the cash passenger, including the ride on transfer when used, is 2.88 miles. The difference between the present average ride and the probable paying haul represents the distance over which the average passenger is carried at a loss to the company.

Increased Revenue Is Needed

The Springfield division (the present central five-cent fare zone) failed during the fiscal year 1916 by about

$225,000 to earn enough to make a proper return on investment, and set aside a proper amount for depreciation and a proper contingency fund. Approved improvement requisitions, not yet completed, call for the addition of about $750,000 to the investment, and estimates shown of the cost of improvements which will further be required call for an additional expenditure of about $1,000,000. These expenditures cannot be made unless some measures are taken to increase the net income of the company.

Some of the recommendations, Professor Richey says, look toward reductions in operating expenses, but these probably will be more than balanced by increased prices of labor and materials. It is evident, therefore, that it will be necessary to increase the revenue. A fair method seems to involve the placing of the additional burden on the traffic which originates in the outside districts. This might be accomplished by establishing an inner 5-cent fare zone with a radius of about 2 miles and making an additional charge of 2 or 3 cents to riders beyond that zone, with the transfer privilege only slightly modified. A second plan might provide a 5-cent ride with free transfer between any two points within the central 2-mile radius zone and a 5-cent fare without transfer between the downtown district and the outlying limits of the present 5-cent fare zone.

A zone system, Professor Richey states in conclusion, will involve a number of difficulties in the proper collection of fares and use of transfers. It is not impossible to develop a system of fare collection and transfers which would reduce such difficulties to a minimum. However, such a development may require some considerable time, and in view of the apparent necessity for some immediate relief, it may be deemed advisable to obtain it by a flat increase to a 6-cent fare. Such a fare might later be replaced by a zone system after detailed studies had been completed.

Public Ownership Discussed

Public ownership was the chief topic before the regular monthly meeting of the Massachusetts Street Railway Association at Young's Hotel, Boston, on May 23. The speaker was Benjamin C. Marsh, secretary of the League for Municipal Ownership and Operation of New York. Mr. Marsh was requested to address the association in order that the members might obtain the viewpoint of government ownership advocates in connection with existing street railway financial difficulties. Mr. Marsh contended that the private ownership of public utilities was undesirable. In advocating public ownership he urged that the present operating officials and staffs be retained. G. S. MacFarlane, editor of the Boston *American*, spoke in similar vein. On behalf of the railways, Bentley W. Warren, Boston, addressed the meeting after the advocates of government ownership had been heard. He pointed out the sound capitalization of the roads in Massachusetts under the regulatory policies of the State and endeavored to show that the present return was far below that necessary to attract capital into the industry for anything like adequate development. Mr. Warren said that present rates of fare were ruinous. He set forth the fundamental points in relation to cost of service which the public must meet by decreased taxes or by higher rates.

The lines of the Portland Railway, Light & Power Company, Portland, Ore., afford access to many of the trout and salmon streams and fishing grounds in that district. The company has issued a folder entitled "The Trout Route," which gives information on fishing laws, the best streams and how to reach them by trolley.

New York City Hearings to Start on June 6

Third Avenue Railway's Application for 2-Cent Transfers to Be Considered First—Mayor Mitchel Opposes Revenue Increase

THE Public Service Commission for the First District of New York has set June 6 as the date for beginning hearings upon the applications of the street railways in New York City for action by the commission which will give them financial relief. The three main systems concerned are the Third Avenue Railway, the New York Railways, and the surface lines of the Brooklyn Rapid Transit Company. In general terms, each of these companies desires that the commission's existing order directing that transfers be exchanged upon the lines of each system be abrogated or that a charge of 2 cents be permitted for transfers, with no charge for retransfers.

The commission on June 6 will take up first the application of the Third Avenue Railway, and at public hearings press the case to as rapid a conclusion as possible. It will then take up in turn the application of the New York Railways and that of the Brooklyn Rapid Transit Company lines.

As stated last week in these columns, an application was also received by the commission from the New York & Queens County Railway, but this company did not ask for any specific form of relief. The application has been returned to the company with directions that it be made more specific.

This week an application for relief was filed by the Second Avenue Railroad, which asked the commission to "establish such new regulations in regard to rates, fares and transfer privileges, or otherwise so to exercise its authority as to make possible the earning of a more adequate return upon the capital invested." This application completed the list for New York City.

MAYOR MITCHEL OPPOSES INCREASED FARES

Mayor Mitchel announced on May 25 that he would insist that the city be represented at all the negotiations and hearings before the commission on the applications of the companies for increased fares. The Mayor sent a letter to Chairman Straus, asking him to notify Corporation Counsel Hardy when such proceedings were to be held. In a letter to Mr. Hardy, the Mayor directed him to appear at the hearings and "strenuously and constantly oppose the requests of the companies unless and until they show that the need for increased rates is imperative, permanent, absolutely necessary and cannot be met in any other way."

The Mayor's letter to Mr. Hardy follows in part:

"The policy of a uniform 5-cent fare with free transfers between all subsidiaries controlled by a single street railway has been the recognized policy of the city and State for many years. It should not now be upset merely because the companies may have encountered temporary difficulties, or because the war into which we have entered demands unusual sacrifices.

"Every citizen will be called upon to make money contributions which will be a hardship, and thousands will surrender not only their property, but their lives. Is there any reason why public utilities should be placed in an exempt class and allowed to increase their rates so as to preserve their earnings intact?

"If the companies had been sharing their profits with the public during the years when they were making large returns, their claims might be considered more favorably. But it will be recalled that in past years these companies have made large profits and the city's claims for readjustment or municipal purchase of their property were opposed.

"The companies pleaded that they had contracts with the city, and claimed that their rights to the earnings were protected by the United States Constitution. Hence, if the companies are now encountering unusual difficulties, is it just that the public should be required to bear their burdens when it has been denied any share in their profits?

"Certain of the companies about to petition the Public Service Commission have only recently been reorganized, and their petitions for the approval of large issues of securities were opposed by the commission on the ground that neither the value of their property nor their prospective earnings justified such capitalization. The companies contended that the commission had no jurisdiction over these matters, and they were upheld by the courts, not upon the value of their property, but upon the ground that the law gave them the right to issue any amount of stocks and bonds which did not exceed the total capitalization of the old companies. Consequently, neither the commission nor the public is under any obligation to recognize the claim of the companies to earnings upon excessive capitalization."

Reply of President Shonts

Theodore P. Shonts, president New York Railways, on May 26 sent a letter to Mayor Mitchel, replying to the Mayor's letter to Corporation Counsel Hardy. President Shonts said in part:

"You are quite right in saying that the war demands universal sacrifices and the universal sharing of burdens. The public utilities which I represent, and, I am sure, all others, are only too willing to bear their share of all such burdens. But is there any reason why public utilities should be compelled to bear more than their share?

"You state very correctly that it 'has been the recognized policy to charge a uniform 5-cent fare, with free transfers.' But those of the present are very new conditions—conditions which must be met, unless the public service is to suffer. It has been the long-continued practice of the United States government to charge 2 cents for letter postage, but in the current revenue bill it is proposed to increase the postage to 3 cents.

"The steel companies have heavy burdens, and they raise their prices. Bakers must pay more for their flour, and they raise the price of bread. The old-fashioned 'dollar watch' now sells for $1.35. The 5-cent package of biscuit now retails at 8 cents. The newspapers pay more for their paper, and there is a very general movement to increase the price of newspapers from 1 to 2 cents.

"Street railways are paying more for their labor, more for their materials, and higher taxes, as their share of the burden of government expenses. All of these are burdens imposed by the war. Is it fair, then, that the public utility, and especially the street railway, should be singled out as the only kind of corporation which should not be permitted to raise its price in order to enable it to pay its tremendously increased expenses for rendering its service?"

President Shonts also took exception to the Mayor's remark that "if the companies had been sharing their profits with the public during the years when they were making large returns, their claims might be considered more favorably." He added:

"The facts are that the properties comprising the present New York Railways have, during the last ten years, either been in the hands of receivers or operating without any profits to share. Yet during that same period the properties have paid the public more than $1,000,000 a year in taxes or more than 10 per cent a year of their gross earnings.

"This is the first time we have heard any proposition by the city for municipal purchase. I may say, however, that our company is in an extremely receptive mood toward any proposition contemplating a partnership between our company and the city, whereby the service to the public may be protected and the burdens of giving that service equitably adjusted in the public interest."

Working to Prevent Automobile Accidents

The Aurora, Elgin & Chicago Railroad is making an especial attempt to impress upon automobile drivers the great need for caution on their part to help in preventing collisions between automobiles and street cars. As a direct appeal to motor drivers to co-operate with the company's motormen in avoiding this class of accidents which has come to be so numerous, the company has had 20,000 cards printed, as shown herewith, and distributed in the automobiles and garages throughout the territory served by the railroad. This has met with very favorable comment on the part of the automobile owners and drivers, and in several instances applications to the company have been made for additional copies to give to certain friends who were characterized as particularly careless drivers.

COLLISIONS **between Automobiles and Street Cars**

FRIEND DRIVER: Our Motormen are doing their best to prevent this class of accidents, *but cannot be wholly successful without your aid,* and we appeal to you for your co-operation in this matter of such great mutual importance.

Allow us to make a few friendly suggestions, of some ways in which you can do your part in this good work, which are called to mind by collisions which have occurred in the past.

First: Before crossing a track at a Street Intersection, look both ways and have your auto under control, so that you can *surely stop* before reaching the track, if there is a street car coming from either way.

Second: Always *stop, look and listen* before crossing any track on a country highway.

Third: When driving alongside a street car track, *never turn onto the track, or close to it,* without first looking back for a street car which may be coming behind you.

Be particular about this when passing a vehicle which is standing near the curb.

Fourth: Use *more* than ordinary care when driving out of Buildings, Yards or Alleys onto streets where there are car tracks.

Fifth: Remember that an *automobile* can be stopped in *much less distance* than a *street car* can be stopped, if both are going at the same speed, and bear in mind also that a Street Car cannot turn off from its tracks to avoid a collision.

Sixth: A few seconds' delay may prevent a severe personal injury or costly property damage.

Seventh: The *law* requires as high a degree of care on *your part* as it requires of the Motorman.

Safety First Is Thinking First

By thinking and working together, we can be of great mutual benefit; and together can make *safety* the *first* consideration, *in fact* as well as *in name.*

The Aurora, Elgin & Chicago R. R. Co.

Boost for Safety **Pass This Word Along**

INDUCING THE AUTO DRIVER TO CO-OPERATE IN AVOIDING COLLISIONS

The Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., is advertising its service to Fort Sheridan and the Great Lakes Naval Training Station from Chicago and Milwaukee and intermediate points.

Editors Hear Department Heads

Cabinet Officers, Members of the Council of National Defense and Others Connected with the Government at Washington, Explain War Problems to Technical Papers

An editorial conference of the business papers of the country was held in Washington on Friday, May 25, in the cabinet room of the New Willard Hotel. Its purpose was to allow the editors to obtain information first-hand from the heads of important departments of the federal government on the problems which the government is facing in connection with the present emergency. Abstracts of the various addresses follow.

NO SHORTAGE OF COAL

The first address of the conference was by Francis S. Peabody, chairman committee on coal production, Council of National Defense, who explained the relation between the civilian bodies in Washington and the federal departments, and said that the civilian helpers had found the departments most efficient and not hampered with red tape. It was a great pleasure, he said, for these civilians to realize that age is no barrier to service for the government. He explained that there was no shortage of coal but only a coal panic, brought about by householders believing that it was necessary to fill their bins immediately for next winter's consumption. The production was larger last year than ever before, and if people would wait all would be supplied. The chief trouble at present was in transportation, not in production. Priority in shipments should be given first to the urgent needs of the government, second, to those of manufacturers of munitions, third to roads carrying coal, and fourth to roads carrying grain and other food products.

THE AGRICULTURAL SITUATION

The second speaker was Dr. Raymond A. Pearson of the Department of Agriculture, who said that in 1916 there was a reduction in crop yield throughout the entire world, due to a shortage of labor, a shortage of fertilizers and to climatic conditions. The speaker urged that all corporations encourage their employees to participate in gardening, particularly of foods that can be kept for next winter's use. It is also desirable for each section of the country to produce the food that it will need for its own use. In this way the transportation facilities of the country will be relieved for war needs. The co-operation of business concerns in allowing their employees to assist is especially important during harvest time in getting in the crops, as that is the peak of the load. A great many business men have agreed to pay their men at this time the difference of wages, if any, between that which the farmer can pay and what they would have been earning in the factory or wherever they have been employed. The speaker estimated the shortage of farm labor at the present time to be from 1,500,000 to 2,000,000 men.

ADDRESS OF SECRETARY REDFIELD

Hon. William C. Redfield, Secretary of Commerce, then spoke about various lines of work in which the department was engaged, notably in developing the supply of fish for food, and, through the Bureau of Standards, of creating the industries of optical glass and dyestuffs. Secretary Redfield urged the editors to impress upon their clienteles the reasonableness of any export limitations which the government may impose, as well as the value of the co-operation which the government departments are receiving from volunteer civilian assistants.

FRANK A. VANDERLIP ON FINANCIAL NEEDS

Mr. Vanderlip spoke of the necessity of organizing the nation for the business of war, which meant organizing all of the industrial powers of the nation. The present authorized loan of $7,000,000,000 was the biggest financial operation which any government has ever undertaken. All of the money in all of the savings banks of the country is $5,000,000,000. All of the stocks of all of the railroads of the country are $8,700,000,000. All of the money in all of the bank vaults of the country is less than $2,000,000,000. The country is rich and its wealth is estimated at $250,000,000,000, but it is in farms, homes, railroads and factories. The money on deposit in banks is not idle but is out on loans and cannot be called in to pay for the first issue of $2,000,000,000 without causing great distress and business depression. Instead, the loan must be placed by an expansion of individual banking credit and financed out of the savings of the future. The savings of the past are not available because they have been invested. This country has a more difficult job in one way than England had, as it is absolutely self-contained now—that is, there is no place to go to for money. Whatever is done, we must do it by anticipating the savings of the future. This will be a lesson of tremendous importance in thrift to the whole nation. This policy of thrift does not mean that general business is going to be bad.

On the contrary, business is going to be more active than ever before, but it will be a business in necessities. People cannot give the government $7,000,000,000 of purchasing power and expect to have as much purchasing power themselves as before. It will be an absolutely unpatriotic thing to spend money on an unnecessary thing, no matter how much money one has, not only because of the money spent but of the labor diverted from national purposes. Persons will be thrown out of employment by this change in conditions, but not into unemployment, as there will be two jobs waiting for every person now engaged in unnecessary business. The speaker urged his auditors to impress on their clientele that we are in a real war, a war that must measure our whole co-ordinated forces, our moral forces, our industrial forces, and our financial forces. Undoubtedly we shall see inefficiency developed, but the experience of that inefficiency is going to make every citizen see that he has duties of citizenship, and more clearly than ever before.

ADDRESSES OF SECRETARIES DANIELS, LANE AND BAKER

Hon. Josephus Daniels, Secretary of the Navy, declared that those who established the navy provided wisely that its officers should come from every section of the republic, and many of the greatest admirals in the navy are from inland states and had never seen salt water before going to Annapolis. The first need of the navy is for men, and the recruits now coming in are of a very high grade and many have engineering knowledge. The second need of the navy is for ships. Those too old to serve can assist in financing the government.

Hon. Franklin K. Lane, Secretary of the Interior, outlined the issues of the war and declared that it was one for democracy and that "government by the soldier is not consistent with government by the people."

Hon. Newton B. Baker, Secretary of War, was the next speaker. He expressed the belief that the German ruling mind had become so upset with the grandeur of industrial supremacy that it had lost complete sense of the existence of moral standards. The Secretary also said that in its mobilization of the resources of this country for war purposes, the government would necessarily break in upon the long-established habits of great numbers of people. This is inevitable. Everyone will be asked to do something or to give up something, but this sacrifice is necessary in the national interest. In conclusion the speaker said that the government would not ask the papers to forebear criticism of the government, but urged that it be constructive.

Address of Secretary Wilson

The conference then listened to an address by Hon. William B. Wilson, Secretary of Labor. He said that in the co-ordination and reorganization for war our industries must go through a process of mobilization, and this means also the mobilization of labor and a change from one industry to another. Such changes mean changes in working conditions, and it is the function of the departments of labor of the federal government and of the state governments to assist so that these changes will be made with the least possible friction. This mission is to be performed not judicially, but by finding a common ground between employers and employees which will be mutually acceptable, even though it may not be mutually satisfactory. The speaker illustrated the services which can be rendered by the Department of Labor by quoting the results obtained from recent mediation in the coal business. Another hope of the department is to assist the farmers at harvest time by arranging so that employees in other industries will be released during those weeks to assist in harvesting the crops. At such times the owners of factories can arrange to close down the plants and make necessary repairs.

The Petroleum and Gasoline Situation

The production and consumption of petroleum and gasoline in the United States were discussed by Van H. Manning, director of the United States Bureau of Mines. Mr. Manning said that of the 54,000,000 barrels of gasoline now being produced in the United States, between 55 per cent and 60 per cent is used in the automobiles of the country, 20 per cent to 25 per cent is exported, and the balance is used in stationary engines, motor boats, and tractors and for various purposes of minor importance. In the speaker's opinion the call for gasoline will not be reduced from these figures—in fact, a much larger amount seems needed. There is an equal demand for other products of petroleum, such as the use of lubricating oils, and radical steps should be taken to conserve the use of this material. One of these is the substitution of coal for crude petroleum as a fuel under boilers for the generation of steam. The increased demand because of the war is difficult to estimate. The Bureau of Mines is studying more efficient methods of production of gasoline, as by the so-called cracking process, the extraction of vapors from natural gas, and the utilization of liquid fuels from other than petroleum bases. Substitutes for gasoline, such as the production of distillation of coal, are being used at present in Europe for motor fuels and may in time be used for that purpose in this country, as many by-product coke ovens are now being constructed.

Address of Herbert C. Hoover

The next speaker was Herbert C. Hoover, food administrator, who thought we should prepare for a war of attrition, and that meant a long war and one in which this government will have to bring to bear every possible national resource. Most of the food for Europe during the coming year will have to come from North America, because there has been a harvest failure in the Argentine, and Australia and India are practically cut off from the shipping point of view. We must have a lower level of prices and greater stability of prices than during the last year. If prices can be stabilized the margin between producer and consumer will diminish materially. Another necessity is the reduction of waste, both national and in the household. In the latter there are four directions in which the women can accomplish an enormous amount of saving. One of these is substitution, by the use of local products for those from distant fields and vegetables for staples, another is a reduction in actual consumption, as most people eat 40 per cent more than they need. Then there is the question of household waste and the doctrine of the "clean plate."

Addresses by Officers of the Council of National Defense

The conference then listened to addresses by several officers of the Council of National Defense. Walter Gifford, director, outlined the organization and aims of the board and gave a sketch of the scope of the work of the important committees. Frank Scott, chairman of the munitions board, quoted examples of some of the recent work assigned to that board, including the erection of cantonments for more than 1,000,000 men. He said that the board would be obliged to build what amounted to thirty-two cities in the United States to house approximately 30,000 men each. This is the equivalent of the housing capacity of Buffalo, Syracuse and Rochester together, with sewage system and water system, heating facilities and lighting system, laundries and water systems, and this must be done between the present time and the middle of September. Dr. Franklin H. Martin, in charge of Red Cross work, medicine and sanitation, described how surgical instruments had been standardized and gave an account of the work undertaken by that department.

Committee on Public Information

George Creel, chairman of the committee on public information, then explained to the editors the system adopted by the government of giving out information and the rules which the government would like to have the papers follow in referring to military operations.

Organization of the Steam Railroads

Howard Elliott, formerly president of the New York, New Haven & Hartford Railroad and now a member of the executive committee of the Council of National Defense, then described the organization of the steam railroads. There is a main committee of five, with subordinate committees in each of the departments of the country, committees on car service, military equipment standards, military transportation accounting, military passenger tariffs and military freight tariff. The Washington organization has sixteen experienced railway officers, sixty-nine general employees and eighteen inspectors. The committee on car service has twenty-three sub-committees distributed geographically, with an experienced railroad officer as head of each and representatives of all the railroads of each division territory on the committee. The expense of this entire organization, not counting the salaries of officers who are devoting a large amount of their time to this work and carrying on their regular activities as railroad officers as well, is about $500,000 a year, and this expense the railways contribute. The so-called car shortage, Mr. Elliott explained, is not so much a shortage of cars as a lack of terminals, sidings, modern appliances, etc., for handling traffic. These have not been added to the railroads during the last five or ten years to the extent that they should have been added, owing to lack of funds. The so-called shortage amounts to 150,000 cars, and there are about 2,500,000 cars in the country. By more prompt action by the shipper and by all railroad employees, it is hoped that the lack of these cars will be overcome. The railroads are planning to make some changes in their passenger schedules, not with the idea of saving money but to save man power, fuel and motive power, all of which should be applied to the transportation of essentials. The railroads, to have their maximum efficiency, must have the help of every man within as well as outside their organizations who has anything to do with shipping or handling of equipment.

REPORT OF THE GEOLOGICAL SURVEY

A statement of some of the recent work of the United States Geological Survey was presented by George Otis Smith, director. He said that of the four most important metals—iron, copper, zinc and lead—the nation's resources of ore have been found sufficient to meet the rapidly-increasing demands of ourselves and of our allies, although for the present year this means increases of from 50 to 90 per cent above the average output for the years just preceding the war. One of the purposes of the United States Geological Survey is to bring consumer and producer together, and its field geologists are to-day in the West and South seeking to add to the known supply of such other varied minerals and ores as pyrite, glass sand, tin, platinum, graphite, manganese, potash, tungsten, petroleum and nickel. As regards iron, the basis of America's industrial development, the new discoveries of ore are practically keeping pace with the heavy production. On the subject of coal and iron, Americans can be optimistic. The Geological Survey is also studying possibilities in new hydroelectric developments.

ADDRESS OF LOUIS B. FRANKLIN

The final address of the meeting was by Louis B. Franklin and related to the methods being followed in floating the Liberty loan bonds.

Mr. Franklin said that while the other departments of the government were asking for man power, the Treasury Department was asking for money power. The banking resources of the country are handling a record-breaking business from month to month, and their resources should not be strained by the purchase of Liberty bonds to the extent of $2,000,000,000. These bonds should go instead into the homes of people. The banks can help by extending credit to purchasers, but the government does not want to put the load directly on the banks. Some have said that the loan would have a bad effect on business, but if we do not raise the money to finance our armies, our navies, and our allies, there is going to be very little business left in this country. It will be the salvation of business if the war is carried through to a successful conclusion at the earliest possible moment, and money is going to put it through quickly. The funds raised by the present loan will remain in this country and will make the wheels of commerce here revolve faster than they ever have before. The gross income of the country is $50,000,000,000 a year, and at the present rate the government wants 10 per cent of this amount, or $5,000,000,000 a year. Hence, every man, woman and child should devote 10 per cent of their income to the service of the government loan. As already explained, this amount must come out of current savings. Employers should arrange to purchase bonds for their employees and let them pay for these bonds at the rate of 10 per cent of their weekly or monthly pay. In this way the employees will not have to sign checks or go to a bank. If the loan is going to depend on Wall Street, our enemies on the other side who are hoping that the loan will fail will be pleased. The effect of the loan should be to encourage thrift throughout the country, and this quality, if acquired, should stimulate business in years to come. The loans in France and Great Britain have been of a popular character. For instance, the first loan in Great Britain was taken up by 150,000 subscribers, but the last loan was taken up by 8,000,000 subscribers out of a population very much less than ours. With our population of 100,000,000 people, it would be a shame if we could not do as well.

Changing a Carhouse Scrap Pile to a Farm and Garden

Long before the cry "To farms! To farms!" threatened to make every stay-at-home a new kind of embattled farmer, at least one far-seeing railroad man had taken Sir High-Cost-of-Living by the throat and choked him on potatoes.

The railroader in question is J. W. Davies, foreman of the Turk and Fillmore carhouse of the United Railroads of San Francisco who, for the past three years, has been running a combination farm and garden alongside the carhouse.

The suggestion for this plantation came from Jesse M. Yount, master mechanic of the company, who thought that greenery would look better than a repository of scrap iron and other goat provender. At first, the area was simply cleaned up and some climbing nasturtiums were trained to keep their eyes on the shopmen.

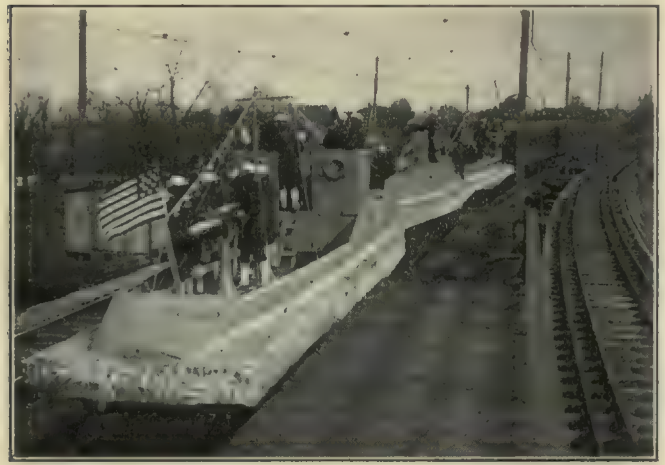
POTATOES IN THE GROUND AND FLOWERS IN THE AIR AT A SAN FRANCISCO CARHOUSE

It is the 1916 growth which is shown in the accompanying halftone. The sticks are not for the intoxicating beer hop, but for the cheerful dahlia. Mr. Davies may be termed a dahlianist as he has raised some 300 varieties. For this season he has divided the plot into two sections—176 ft. x 9 ft. and 183 ft. x 11 ft.—which are devoted exclusively to the delightful dahlia and the justly popular potato.

Electric Railways Co-operate with War Department

Recruiting Train Operated by Chicago Elevated Railways—Help from Railway Industry Discussed by New England Street Railway Club

A FEATURE of the recent reports on war-time activities of electric railways has been the effort to bring about the most effective degree of co-operation between the industry and the government. To this end, Britton I. Budd, president of the Chicago Elevated Railways and of the Chicago North Shore & Milwaukee Railroad, has placed in service a "recruiting train," this being designed to stimulate enlistments in the naval service. The train, which has been operated at frequent intervals around the downtown loop in Chicago, is made up of one of the North Shore line's new dining cars, a steel passenger car which serves as a recruiting office, and three flat cars that are fitted out as replicas of a battleship, a submarine and a submarine chaser. The latter are manned by about thirty marines. A full-sized torpedo is carried on the top of the submarine, and two small guns are mounted on the car that is fitted up to represent the submarine chaser. One of these guns, a one-pounder, is fired at intervals during the travel around the loop, and this, together with a navy band, serves to attract a great deal of attention.


ELECTRIC RAILWAYS IN WAR TIME—RECRUITING TRAIN OPERATED BY CHICAGO ELEVATED RAILWAYS

Recruits are picked up by the train as it passes the "L" stations and while it is standing in the Fifth Avenue terminal between trips. In the evening the train takes recruits that have signed up to the Great Lakes Naval Training Station, which is located on the Chicago, North Shore & Milwaukee Railroad. This procedure will probably be continued for one or two weeks. Meantime plans are being formulated for operating the train over some of the electric railway properties outside of Chicago. The three flat cars have standard M. C. B. equipment, so the train can be taken over practically any electric railway system in the central western territory, and it has already been loaned to the Aurora, Elgin & Chicago Railway for use on that company's lines.

NEW ENGLAND STREET RAILWAY CLUB DISCUSSES WAR-TIME PROBLEMS

Co-operation with the government was the keynote of the meeting of the New England Street Railway Club, in Boston, Mass., on the evening of May 24. President A. H. Ford occupied the chair, and among the guests were many army and naval officers of distinction, including Brig.-Gen. Clarence R. Edwards, U. S. Army. In an address General Edwards made the point that railroads and street railways can help at this time by arming section gangs and carhouse forces, giving a revolver to about 25 per cent of the men and providing the rest with clubs for patrol work, thereby releasing guardsmen for intensive training or first-line work.

President M. C. Brush of the Boston Elevated Railway was called upon by the chair to speak on behalf of the electric railway interests. With regard to his company about 1800 blue-uniformed men are between twenty-one and thirty-one years of age, and in other branches of the company's work 1500 men. To the extent that older men and women can be substituted, enlistment from electric railway service is to be encouraged, but the importance of electric railway transportation is so great that it should be maintained intact so far as possible. "Not for weeks," said Mr. Brush in this connection, "have we hired a man under thirty-one. As the war continues, we plan to use women in every conceivable capacity. I have no fear of the treatment which will be accorded women in Boston or New England. We have selected a uniform including overskirt, jacket, cap and badges for women conductors."

Mr. Brush said that manufacturers should co-operate by being willing to close their establishments at different hours, thereby reducing the peak demand on the street railway system, which is the great problem of the company. Mr. Brush agreed with General Edwards that the time has come for electric railways to take up the burdens of bridge and other protection, so far as required to release soldiers for intensive training and active field service. On the Boston Elevated Railway 850 special police have been sworn in for war-time service.

The speaker said that whereas the entire facilities of the Boston Elevated Railway are at the free disposal of the military authorities in any emergency, he believed that the normal service of the company should be rendered to the government at the regular cost. In other words, men in military uniform under normal conditions should be transported at the expense of the government and not free of charge. "The newspapers came to me about this matter, and I took the position you do," interjected General Edwards at this point.

Closing, Mr. Brush said that there never was a time when the electric railways were so poorly prepared financially to be of the maximum service as to-day but that the country can count upon their doing the utmost within their power to help win the war.

MISCELLANEOUS NOTES

In Chicago the railways have been prominent in connection with the Red Cross campaign for members. The Chicago Surface Lines turned in 11,000 names as new members and paid $11,394 in cash to the society as the result. About 8000 of the new members were from the company's transportation department, and about 85 per cent of the total number of employees of the Chicago Surface Lines have joined the society. As names are still coming in, the total membership within the traction company's organization is expected to exceed 12,000.

Public utilities uniting for war service is a feature of the recent developments in New York City. Here the power, light and traction companies will co-ordinate their efforts to aid the government, as mentioned in the ELECTRIC RAILWAY JOURNAL for May 19. Recently this organization, which has been formed at the behest of the Public Service Commission, First District, has announced that it will be represented by a permanent executive committee, of which Travis H. Whitney, public service commissioner, is chairman and Ivy L. Lee secretary. The membership includes also George Keegan, Interborough Rapid Transit Company; Edward A. Maher, Jr., Third Avenue Railway; John J. Dempsey, Brooklyn Rapid Transit Company; Wilbur C. Fisk, Hudson & Manhattan Railroad, and Frank R. Ford, representing the American Electric Railway Association.

On the Berkshire Street Railway the employees have been organized into syndicates for working unused land belonging to the company. Under this arrangement the company supplies the land, plowing, harrowing and the seed all being financed directly through the general manager and the cost being returnable at the time of gathering the crops. Each syndicate takes about 2 acres and its general supervision is under one of the officials of the company. Four of these syndicates have been organized, each made up of twenty employees, and they have planted 4 acres to beans and 4 acres to potatoes and cabbage.

COMMUNICATION

What Causes Double Wheel Treads?

MELBOURNE, BRUNSWICK & COBURG
TRAMWAYS TRUST
COBURG, AUSTRALIA, April 25, 1917.

To the Editors:

I shall be pleased to hear from any of your readers if in investigating the trouble of "double treads" on car wheels they have arrived at a satisfactory explanation of the cause.

We use Brill 21-E trucks with wide-winged axle boxes and M. C. B. journals. The truck wheelbase is 7 ft., and rolled-steel disk wheels, 33 in. in diameter are used. We use British standard 90-lb. flanged girder rail on tangent track and 96-lb. standard rail on curves. Curves in opposite directions in the permanent way balance each other. All wheels are pressed on at equal distances from the ends of the axles with the aid of a special gage and a center pop in the middle of the axle.

On several of the equipments there is no sign of this trouble; on one or two only one wheel out of the four shows it, accompanied by a thin flange on the mate; on other equipments two wheels, both on the same side, show the double tread, the mate showing thin flanges, and in still other cases one wheel on one side of the truck and the wheel on the other pair on the opposite side had developed the trouble.

There was one instance in which I took a pair of wheels on their axle, in perfect order, after they had made 21,000 miles under one car, and placed them under another car to replace a set where a bad double tread had developed. The new pair immediately started to develop a double tread, and the pair which replaced the good pair on the original car, although freshly turned, also started to develop a double tread. In another instance I turned up both pairs of wheels for double tread and replaced them under the same car. These wheels have so far given no sign of double tread. Since this matter has been given attention great care has been taken to see that all trucks are assembled perfectly square, but this apparently has had no effect.

I do not see how any track defects can produce such irregular defects in the wheels and therefore am of the opinion that the cause is confined to the trucks, axle boxes and journals.

STRUAN ROBERTSON, Engineer and Manager.

AMERICAN ASSOCIATION NEWS

Bulletins of Committee on National Defense

In addition to its activities in compiling data for the government the American Association committee on national defense is sending out a series of bulletins to member companies. Of these the first was reprinted in the issue of the ELECTRIC RAILWAY JOURNAL for May 26.

The second bulletin related to co-operation with the Secretary of Commerce in his efforts to increase food production. It was suggested that companies can make their co-operation valuable: First, by awakening, through car and other forms of advertising, and by personal efforts of their agents, the interest of farmers and truck raisers along their lines to the importance of bending every effort to carry out the President's injunction as to food production; and, second, by carefully studying and putting into effect methods of assisting such farmers and truck raisers in the marketing of their product. Companies are urged to get into touch with government departments of agriculture and other agencies which are concerned in increasing food production; and to encourage employees to raise garden products sufficient at least for their own needs.

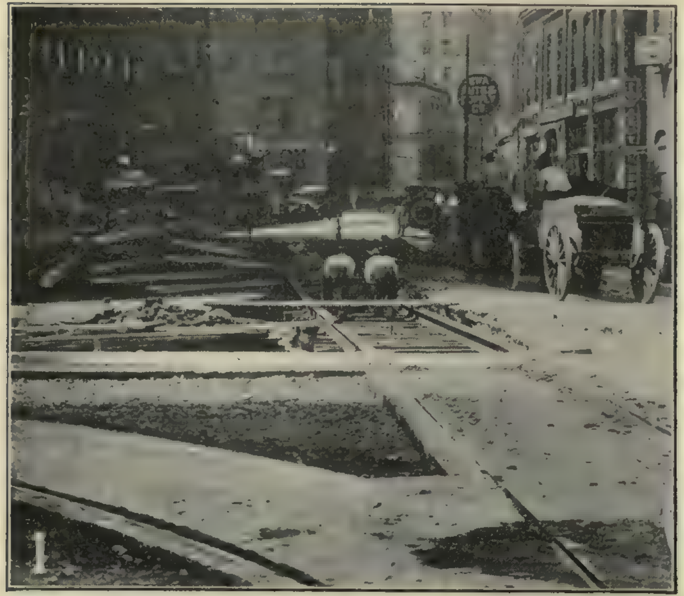
Bulletin No. 3, issued May 26, suggested plans for assisting employees to purchase "Liberty Loan" bonds, particularly by arranging for installment payments. Bulletin No. 4, sent out on Tuesday of this week, covered the subject of next Tuesday's registration, particularly with reference to requests for exemption from active service for men considered essential to the maintenance of good service.

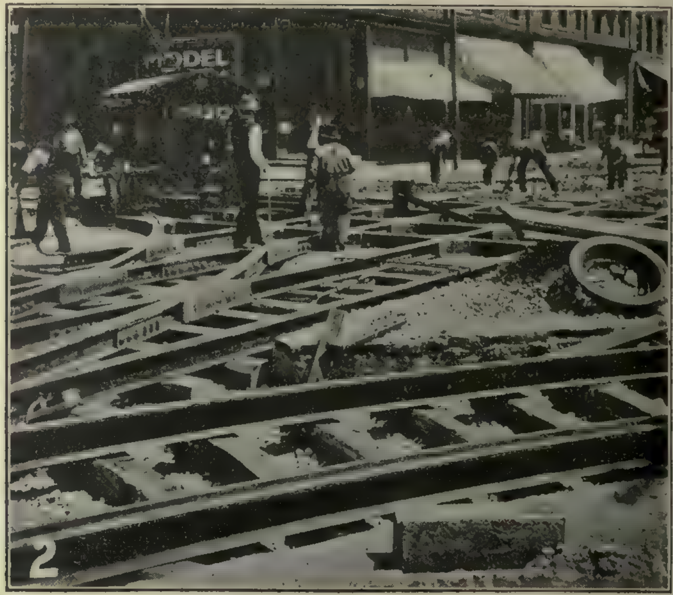
Patriotism the Keynote at Toledo Section Meeting

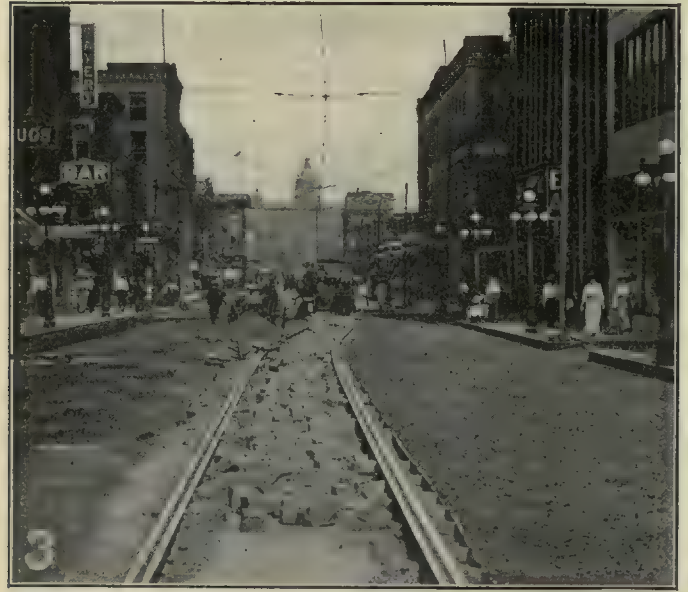
Judge Daniel J. O'Rourke of the Toledo city court made a patriotic address before 300 members at a meeting of the local company section held on May 25. His talk dealt with the importance of the central station in the great war, and with the co-operation which must exist between the producing and distributing army and the fighting army. A. C. Rogers explained a partial payment plan under which employees could buy "Liberty Loan" bonds, and to this talk has been credited much of the alacrity with which subscriptions poured in during the following day. Motion pictures of the Toledo troop of the National Guard in service on the Mexican border were also shown.

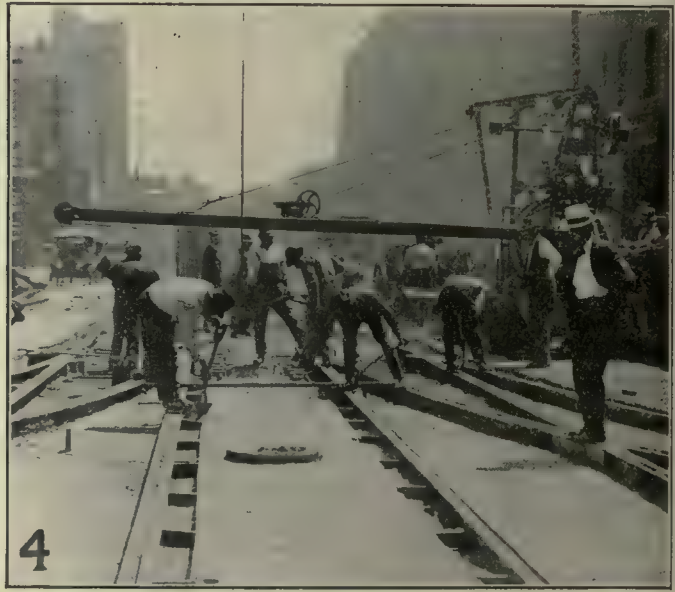
The election resulted in the return to office of the following, who were elected last February for a partial term. The respective departments appear after the names: T. J. Nolan, chairman, production; G. E. Snider, vice-chairman, electric; H. Friede, secretary, engineering; A. G. Van Driesen, treasurer, executive. Directors: James Doheny, Central Avenue shops; Duff Poirer, transportation; W. C. Cramer, gas; A. C. Rogers, heating; R. A. Eck, accounting; H. J. Kunz, new business; B. R. Donovan, claim; H. E. Wheaton, railway.

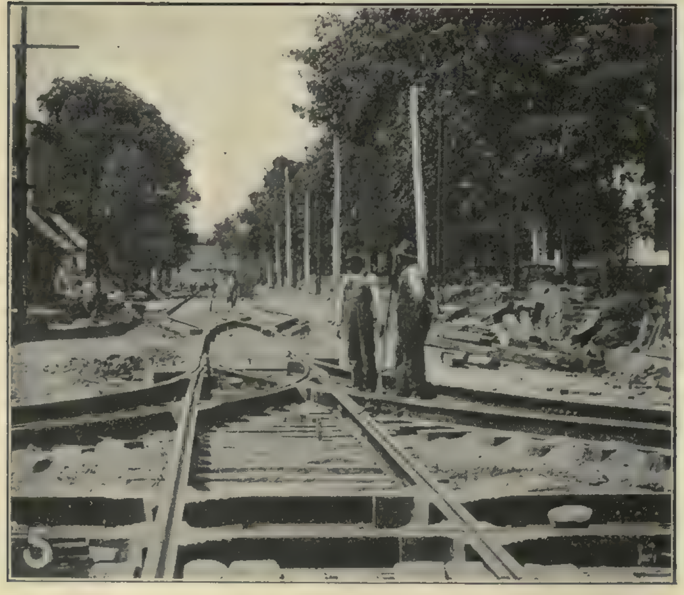
The Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has conducted two excursions recently from Fort Wayne to St. Louis, Mo., via Bluffton, Ind., and the Toledo, St. Louis & Western Railway (Clover Leaf).











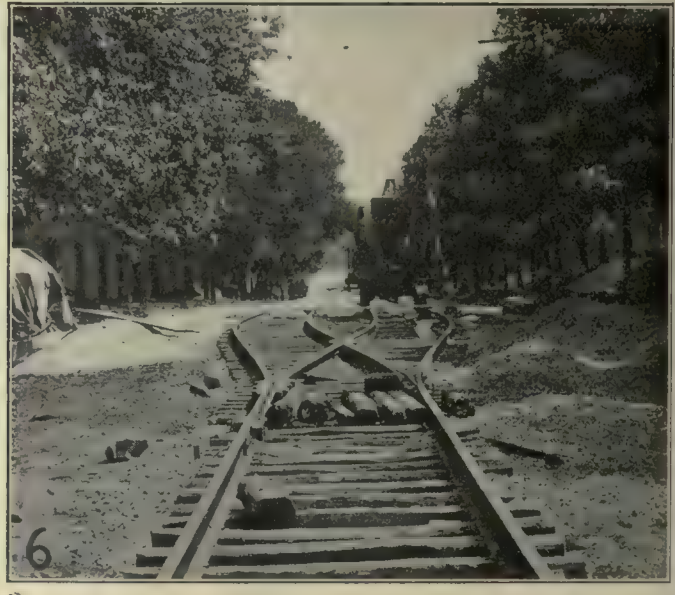


Fig. 1.—Granite block paving all the way across between rails. Fig. 2.—Installing special work at West Ninth Street and Grand Avenue. Fig. 3.—City paving work under way in conjunction with track construction. Fig. 4.—Pouring concrete base, leaving space for granite nose blocks. Fig. 5.—Double track reduced to single track at intersection to save space and cost. Fig. 6.—Residence track construction. Note temporary flanges on traction wheels of concrete mixer.

Typical Track Construction Scenes in Des Moines (Iowa) Streets

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Track Construction in Des Moines

Entire Downtown Track Layout Rebuilt Without Stopping Traffic—Types of Construction Described

BY W. L. WILSON

Chief Engineer and Engineer Maintenance of Way, Des Moines (Iowa) City Railway

During last summer the Des Moines City Railway relaid a large part of the track in the downtown or loop district of Des Moines. This included 15,147 single-track feet of new construction and almost 6000 ft. of special work, including fourteen layouts. In addition some 8 miles of track was constructed or rebuilt in the residential districts. An interesting feat in connection with this work was the fact that at least one side of the downtown streets was kept open to vehicular traffic at all times and street car traffic was continued on every line during construction work. All special-work layouts were installed under traffic with the exception of one double-crossing and four-curve layout. Working under these conditions of course greatly obstructed the free progress of the work, but it was imperative that every facility possible be given to vehicular traffic. The necessity of keeping all tracks under service also imposed certain limitations on the type of construction used.

The occasion for so general a change at one time was the complete rerouting of cars and the very bad track conditions, the latter being the result of many years' operation without a franchise and consequent lack of new funds to put into the property. Previously all cars had been routed from outlying points into the business district and there looped around and back over the same line. Under the revised plan, several lines were through routed, eliminating a lot of the congestion in the downtown section and giving better service to the public, but necessitating several new special work installations. The construction work in this downtown area was done on contract basis by the North American Railway Construction Company, while that in the residence district was done by the railway company itself.

DOWNTOWN CONSTRUCTION

A concrete base, 6 in. thick underneath the ties, was laid for the business district track, of which a cross-section is shown in one of the accompanying drawings. Weathered white oak hewn ties, spaced 2 ft. centers, were seasoned naturally as thoroughly as possible and used without treatment. The 93-lb. section No. 419 Lorain 7-in. grooved rail was fastened to the ties without tie plates by 5½-in. x 9/16-in. ordinary drive spikes, and the concrete base was carried 2 in. above the base of the rail. Over this a 1-in. layer of 1:4 cement and sand, mixed dry, was spread as a cushion for the granite paving block. This dry cushion was allowed to set naturally under the action of the elements, since by this means it rather cakes and sets less hard and less brittle. Underneath the head and groove of the rail the spaces were filled with 1:4 mortar, just stiff enough to be plastered in with a shovel before the nose blocks were placed.

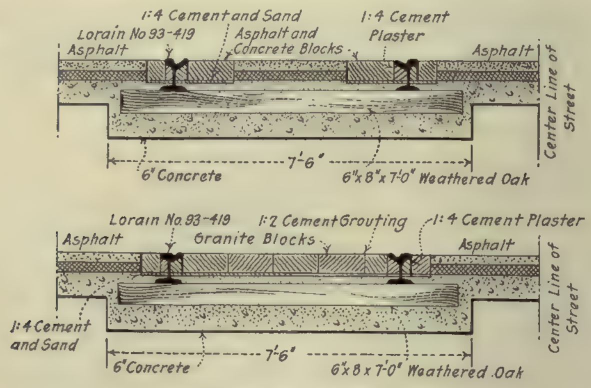
The nose blocks were then set against this mortar and long and short blocks alternated on the inside of the track to avoid a straight line joint and a tendency for rut wear at the edge of the stone in the asphalt pavement. The same arrangement of granite nose blocks on the outside of the rails was attempted, but the Mayor of the city would not approve it, and hence the straight-line joint here was unavoidable. On part of the streets and in all special work the granite block pavement was carried all the way across between rails and 5 in. outside. These granite blocks were quarried in Sioux Falls, S. D., and were specified to come within the limits of 4½ in. to 5½ in. wide, 14 in. to 7 in. long and 4 in. to 5 in. deep. After they were laid in place they were grouted in with a 1:2 mixture poured wet and allowed to settle. Tie rods of 2½-in. x 5/16-in. bars with ¾-in. terminals were installed 10 ft. apart. The rail joints were of the continuous rail type, 26 in. long and held in place by six heat-treated bolts. These bolts being of high tensile strength will not allow any stretch and hence their use practically eliminates this cause of loose joints. All joints were carefully finished with a Vixen rail planer or a reciprocating grinder and each was double bonded with Erico 500,000-circ.mil electrically welded bonds.

TAKING UP OLD CONCRETE IN DES MOINES (IOWA) BY PRYING AFTER DRILLING ROW OF HOLES 6 IN. APART WITH STEAM JACK HAMMER

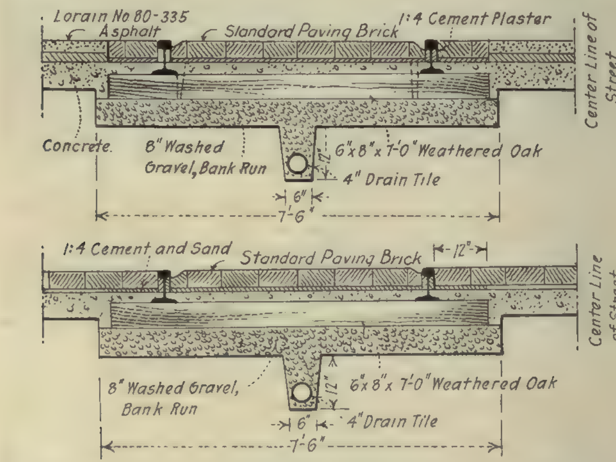
SPECIAL WORK CONSTRUCTION

The special work layouts, of which there were fourteen new or rebuilt sections, were constructed in an unusual manner owing partly to limiting conditions and partly because of the advantages the construction offered. The steel was laid on oak ties tamped up on 8 in. of crushed 1½-in. stone. Reasons for using this type of foundation were that it permits operation over it during construction work without injury to the foundation and it serves as a sort of cushion, which rather deadens the noise. It also has a tendency to increase the life because of the more flexible construction. It is easier to renew parts of special work in this type of construction than when it is necessary to dig it out of solid concrete.

The special work used was the Lorain iron-bound hard-center insert type made up with section No. 480, 114-lb. rail, which joins with the 93-lb. section, No. 419 grooved rail without a compromise joint. The inserts in this construction are bolted in place on beds machined to make a perfect bearing and with spelter poured around the edges. Solid manganese tongue switches were used and wherever these were installed as facing switches they were equipped with spring lock boxes. The flangeways over the intersection were made ¾ in. deep. This carries the weight of the city cars, which have a ¾-in. flange, equally on the tread and flange. The Interurban Railway, which also operates over these tracks, has a wheel flange ⅞ in. high, and hence the car weight is carried over the special-work intersection on the flange alone. The negative return circuit was carried around all special work by a 1,000,000 circ. mil. cable for each rail, connected to the rail by cast copper weld.



STANDARD TRACK CONSTRUCTION FOR DES MOINES (IOWA) BUSINESS STREETS



STANDARD TRACK CONSTRUCTION FOR DES MOINES (IOWA) RESIDENCE DISTRICTS

Residence Track

The type of residence-district track construction in Des Moines is much the same as that already described as installed in the loop district, except for the sub-base construction. Here, instead of 6 in. of concrete below the bottom of the ties, 8 in. of bank-run washed gravel of a sandy nature, taken from a pit on the Beaver Valley Division of the Interurban Line, was laid in the track trench, which had been previously rolled. This foundation material was used in preference to crushed rock, because it has been our experience that it makes a better base and takes less skill to get a solid tamp, and also permits of a more perfect alignment. A layer of concrete 8 in. thick was laid over the sub-base after the tamping and alignment work had been completed, and then the 1-in. layer of 1:4 sand and cement dry mixture was used as a cushion under the paving brick.

The Lorain section No. 335, 80-lb. 7-in. T-rail without tie rods or braces was used on residence track, a cross-section of which is shown. Continuous rail joints were used in the residence track as in the loop district, and also the electrically welded bonds, except that a single 500,000-circ. mil bond per joint instead of the double bond necessary for the heavy traffic area was used. Each joint was ground with a reciprocating grinder before cars were allowed to operate over the rail.

The 7-ft. paving strip for each track laid by the company was paved with brick of local manufacture and locally made brick nose blocks 8 in. long were used. The space between these and the rails was filled in with the same 1:4 mortar and the whole area waterproofed with 1:2 cement grouting. A ¼-in. crown between rails was provided, with the pavement at the center on the same level as the rail top.

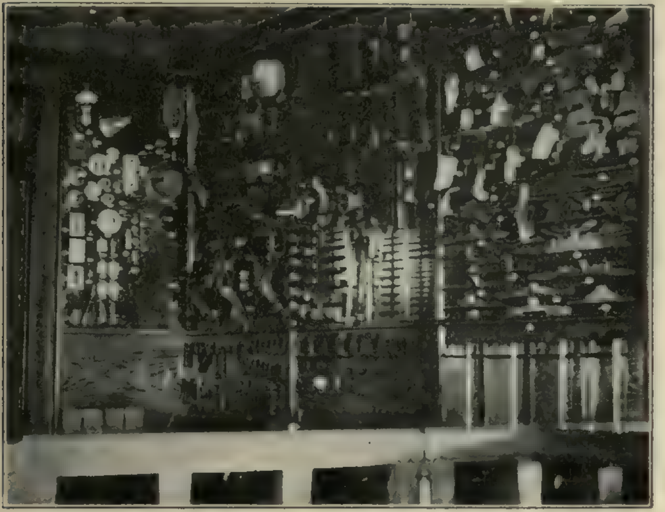
All track except that in the loop district with the concrete sub-base was constructed with a French drain, one for each track and under each curve of all special work. This drain consists of a trench 6 in. wide x 12 in. deep and filled with crushed stone. The base slopes slightly to drain to the sewer. In the gravel-ballasted residence track, a 4-in. drain tile was installed in the bottom of the trench.

In rebuilding one 2000-ft. stretch of old track, the foundation and ties were left in place and the new 7-in. 80-lb. rail put down in place of the old 6-in. 70-lb. tram rail. This raised the crown of the street to a grade 1 in. higher, and the balance of the pavement was sloped off to take care of the difference, but the work was done at a good saving over the cost of tearing up the old foundation.

The loop district tangent track was installed at a cost to the company of approximately $7 a foot of single track, this figure not including any special work or bonding cost. The residence track cost approximately $6 a single track foot. The fourteen special work layouts installed in the downtown district cost the company approximately $80,000.

Galvanized-Iron Wire for High-Tension Lines

Even before copper reached its present high price the Georgia Railway & Power Company installed a number of galvanized-iron high-tension lines where small quantities of power were transmitted. It was planned to replace them with copper when the load reached a certain size. The first installation, 6 miles in length, was in the nature of a test and as no exceptional troubles from reactance and the like were noted further installations were made. To-day about 100 miles of such lines are in use. The longest single line is 10 miles at 11,000 volts, three-phase, 60 cycles, and the power transmitted in 200 kw. The high price of copper has led to copper lines being replaced by galvanized iron in several instances where it was profitable to use the copper elsewhere. A potent reason for this practice is the fact that copper wire now costs about 36 cents per pound, whereas the galvanized-iron wire is obtainable at 93 cents per 100 ft. (13 lb.) or about 7 cents per pound.



STANDARDS MOUNTED IN ENGINEERING DEPARTMENT

Boards for Equipment Standards

The walls of the small reception room of the Denver Tramway Company engineering department have been utilized for mounting samples of the different standards of the company. It has been found that questions constantly arise as to dimensions and general details of the various devices, and by having at hand a sample which may be seen and measured and studied without going out on the work, considerable time is saved and fewer mistakes in plans made.

On this sample board are mounted sections of all the standard rails used by the company, and also the various sections of rails of all other railways with which the company has crossings. There are also angle bars used with the various rail sections, track spikes, special bolts for manganese insert work, various types of wood and stone paving block, sections of ties treated and untreated with both pressure and open-tank systems of penetration; samples of paving sand and car sand, pit-run gravel, screened gravel, various sizes of crushed slag and crushed basalt rock, etc. Covering the overhead work there are various types of hangers, ears, wire sections, return feeder cables, crossing frogs and spring frogs, various bonds, lightning arresters, pole brackets, insulators, all types of switches and sockets for indoor wiring etc.; standard signs used about the system, the moldings used in the various buildings, etc.

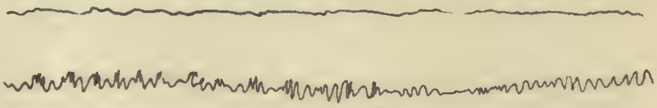
Inexpensive Apparatus for Registering Power House Vibration

Vibrations Are Traced on Smoked Glass, from Which Blueprints are Made for Permanent Record

BY S. R. JONES
Structural Engineer J. G. White Engineering Corporation

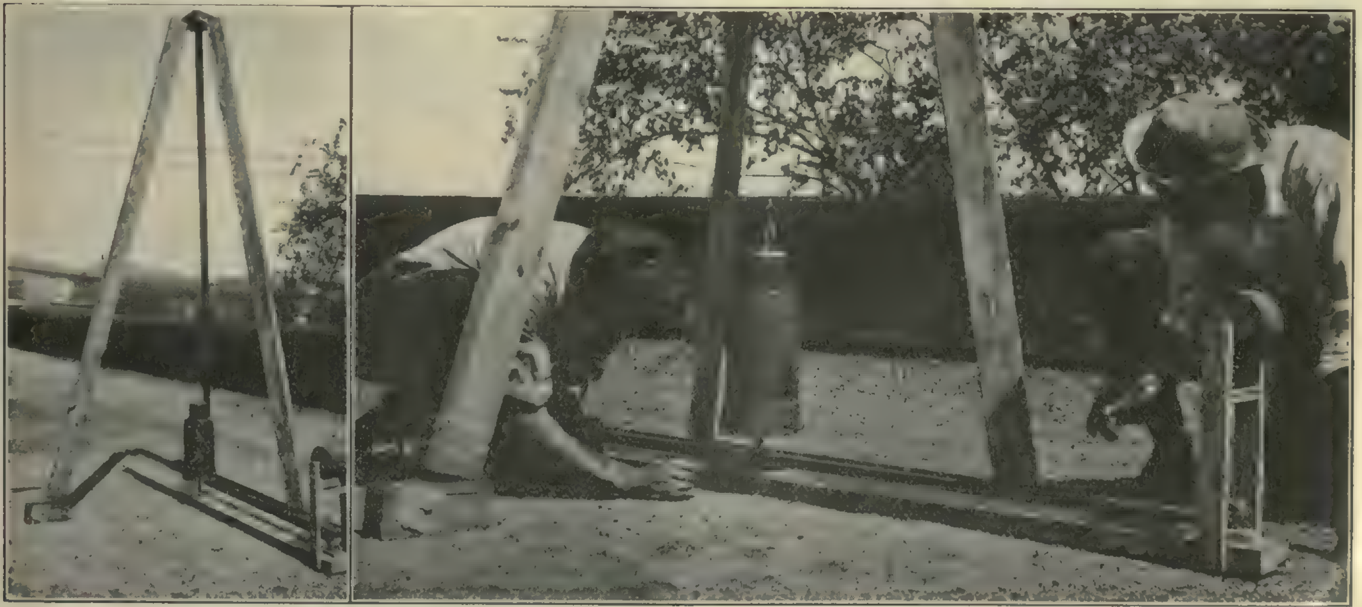
The writer had occasion recently to determine with a fair degree of approximation the severity of vibration in a power plant. As the apparatus used for delicate measurements of this kind was too expensive and unnecessarily complicated for the purpose, the simple but effective apparatus described below was devised and constructed. For the comparisons desired it proved to be amply accurate, and its portability appealed to us also. The apparatus can be made of materials available around any power plant at very slight expense.

After some experiments to determine the best weight of bob, and finding that one of 60-lb. weight was unsteady, we settled on about 120 lb. as the minimum weight which should be used. The construction of the home-made seismograph is as follows:



TYPICAL SEISMOGRAPH CURVES SHOWING DIFFERENT INTENSITIES OF VIBRATION. SCALE APPROXIMATELY ONE-HALF SIZE

The apparatus consists of a tripod about 8 ft. high made of 2-in. x 4-in. lumber hinged at the top to a triangular block. Suspended from this block on a piece of piano wire is a 117-lb. weight. At the bottom of the weight is attached a piece of gage-glass tubing in which a stylus of small-diameter tool steel is fitted. This stylus is so accurately fitted that with a lubricating film of oil between it and the glass tubing there is no lateral play. The vertical motion, however, is perfectly free. A trough is placed underneath the weight and



GENERAL VIEW OF SEISMOGRAPH ON POWER HOUSE ROOF AND NEAR VIEW SHOWING VIBRATION RECORD BEING TRACED ON SMOKED-GLASS PLATE on the foundation the vibration of which is to be measured. This trough consists of a board 6 ft. long by 6 in. wide with strips on either side. The trough contains a slide about 3 ft. long by 4 in. wide which can be drawn along slowly by means of a winding reel. To this slide is attached a strip of smoked glass 3 ft. long by 3 in. wide on which the stylus scratches a record.

The principle of the apparatus is that the weight suspended by the fine flexible wire has sufficient inertia to be unaffected by rapid vibrations and it therefore remains steady, while the smoked glass plate underneath moves with the vibrations of the ground on which it rests. Thus we get a fixed marker writing upon a moving surface. The curves represent the result of two motions, that of the vibration causing the plate to move back and forth across its main axis, and the forward movement caused by moving the smoked-glass plate along its main axis by the reeling device. Of course if there is no vibration a smooth line is obtained, while if there is vibration it is recorded by a wavy line, the maximum and minimum of which give a measure of the amount of vibration.

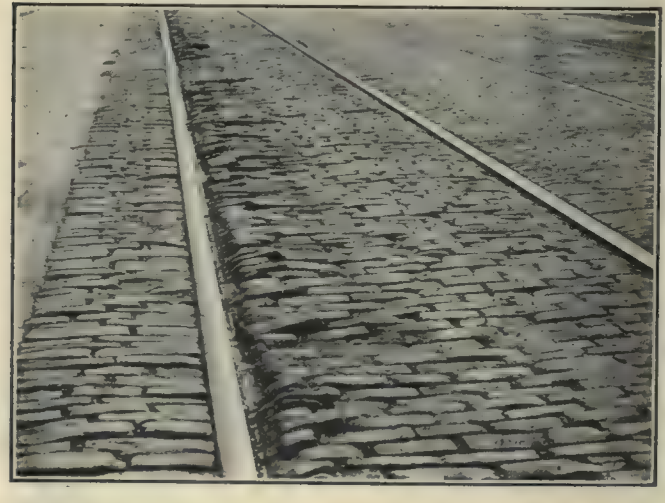
It is well to take the curves over periods of four minutes in order to portray any extremes which might occur due to the synchronous movement of the machines in the power house. The accompanying curves are typical of the records made with this apparatus. Both curves were taken at the same location, but more engines were being operated when the lower curve was recorded.

Effect of Laying Tracks to Follow Crown of Street

BY D. P. FALCONER
Engineer Maintenance of Way, New York State Railways, Rochester, N. Y.

Having one rail ½-in. higher than the other in an attempt to follow the crown of the street has been tried out in Rochester, N. Y., and found to be injurious to the pavement as well as the car equipment.

The effect on the pavement is clearly shown in the accompanying illustration, the paving block adjacent to the outer or lower rail being very uneven after being laid only one year. The wear on the side bearings, journals and wheel flanges was also found to be unusually large. After the wheel flanges became a little worn the car would run down to the low side and then abruptly be shifted back again. This nosing of the car made it rough riding and it also tended to make a wide gage track. When the attention of the city authorities was called to the disadvantages of this construction no opposition was raised to making the track level.

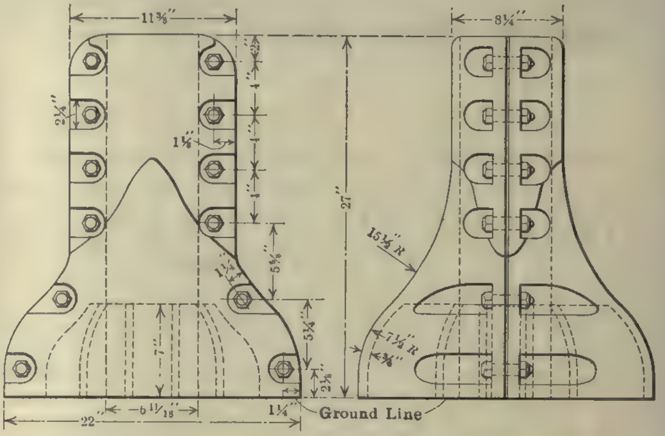


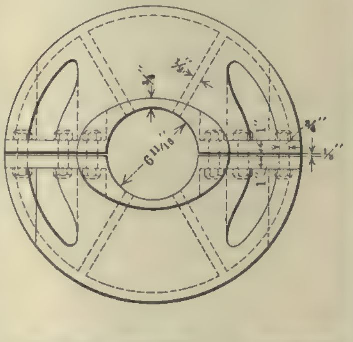
UNEVEN PAVING ALONG OUTER RAIL DUE TO ATTEMPT TO HAVE TRACK GRADE FOLLOW CROWN OF STREET

Two Ways of Reinforcing Corroded Iron Poles at the Ground Line in Richmond

In 1909 the Virginia Railway & Power Company found that a large number of its center poles on Broad Street had corroded badly about 8 in. above the ground line, to wit, at the junction of the pole and a cast-iron wheel guard. To overcome this trouble without sacrificing the poles the company devised a cuff or sleeving made up of two cast-iron reciprocal yokes. Each pair of yokes was furnished with six gripping bolts on each side, as shown, so that the yokes when joined grasped the pole firmly at points well above and below the corroded section. The efficiency of this sleeving, both as a protection against corrosion and as a wheel guard, is proved by the fact that it is still in use to-day.

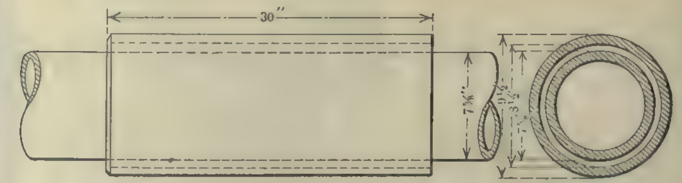
The second drawing shows a simple pole sleeving for sidewalk use, particularly for brick sidewalks. To install this it is first necessary to remove the span wire. This plain sleeving of steel tubing has also proved satisfactory as a protection against corrosion.

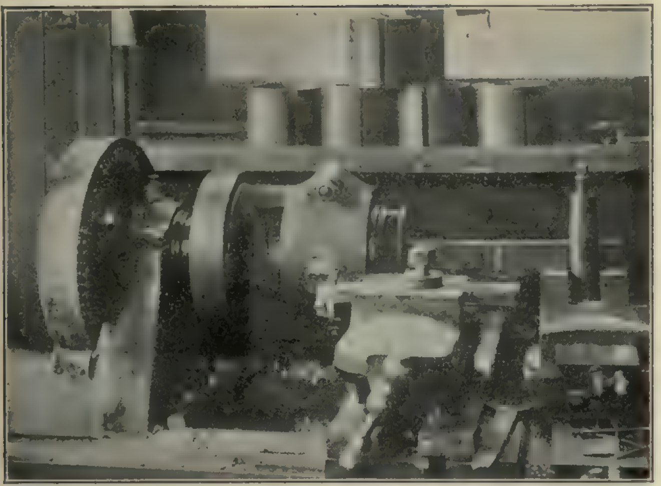




CAST-IRON SLEEVES TO PROTECT AND REINFORCE CENTER TROLLEY POLES AT GROUND LINE

STEEL TUBE REINFORCING FOR POLES SET IN SIDEWALKS





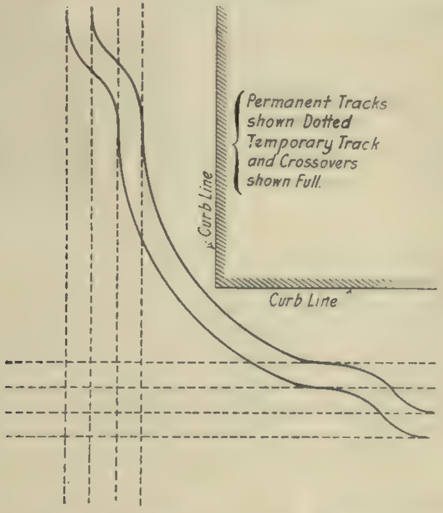
UNIVERSAL BEARING CHUCK USED IN COLD SPRING SHOP, INTERNATIONAL RAILWAY, BUFFALO, N. Y.

A Universal Bearing Chuck

In the accompanying illustration is shown a chuck used for boring bearings of different sizes. This chuck was built by the International Railway, Buffalo, N. Y., and has proved very useful in its shops. The split chuck bushings shown all have the same outside diameter, but the inside diameters are made to fit the different sizes of bearings. The bearing to be bored is inserted in the bushing of the correct size and the whole is then placed in the chuck proper. This is tightened on the bushing by means of the bolts and nuts shown. The photograph shows the two tools used in the boring operation.

Two Portable Cross-Overs and Temporary Track Around Corner Make Car Detour Possible

During the construction of the approaches of the new viaduct in Cleveland, Ohio, it became necessary to divert some of the car lines from their regular routes and this, of course, was planned so as to avoid additional expenditures in special work which would be required only during the construction period. In one instance two lines intersected with no means of interconnection between them, and it was desired to shunt the cars off the one line and turn them onto the other. This was accomplished by an unusual installation of temporary track. It comprised the installation of a left-hand double-track cross-over on one street and a right-hand double-track cross-over around the corner on the other street. The two portable cross-overs were then connected by a temporary track laid on the surface at the side of the street and curving around the corner to interconnect the two lines. Traffic was thus handled in either direction around the corner on the single track with the help of a flagman. A temporary trolley was strung over the curve and the detour arrangement thus made complete with a small permanent investment.

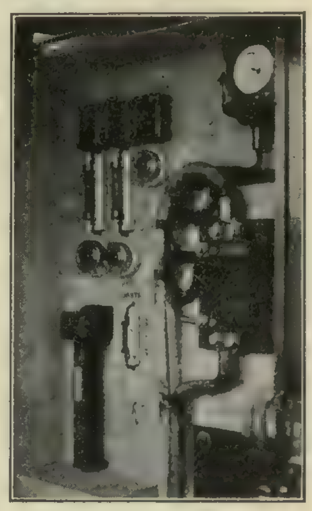

Permanent Tracks shown Dotted
Temporary Track and Crossovers shown Full.
Curb Line
Curb Line

TEMPORARY TURNOUTS AND CROSS-OVERS

VIEW OF PORTION OF TEMPORARY TRACK WORK

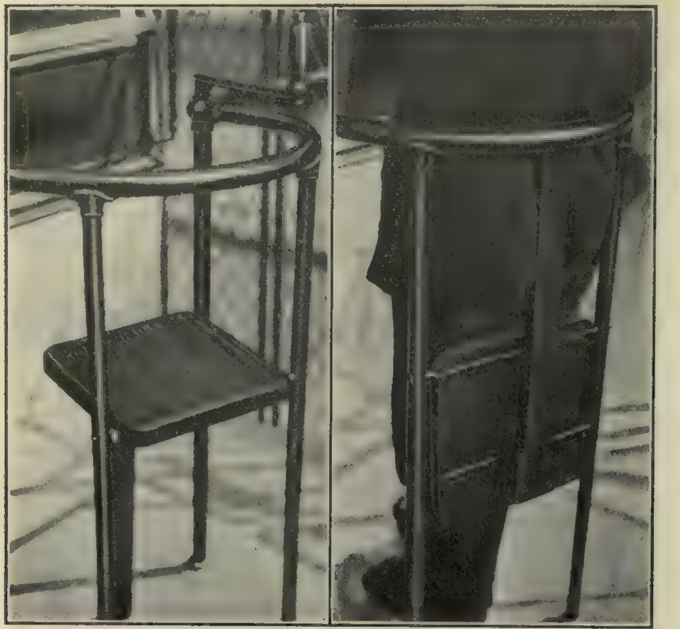
Neat Layout of Fireproof Car Control Cabinet

The control panel on the new cars of the Chicago, North Shore & Milwaukee Railroad is placed in a recess in the front bulkhead immediately behind the motorman. As shown by the accompanying illustration, the cabinet is completely lined with transite board and houses the main trolley-third-rail throw-over switch, the buzzer resistance, the switches for the compressor, headlight, car lights and sign and the Sangamo "Economy" ampere-hour meter and ammeter shunt. This cabinet extends into the car interior about 6 in. and is closed off on the platform side by a steel door lined with transite board. This makes an absolutely fireproof cabinet conveniently located relative to the position of the motorman, and makes a particularly neat layout for the fuses and switching equipment.



FIREPROOF SWITCH AND FUSE CABINET

Stone & Webster interests in Seattle have leased approximately 50 acres of upland and about 25 acres of harbor area on the north end of Harbor Island in Seattle, which, it is stated, will be the site of the proposed ship-building plants to be erected in the Northwest as a part of the corporation's plans to aid in government ship-building. The company is represented locally by the Puget Sound Traction, Light & Power Company. It is also considered probable that the plant will be located in Bellingham, where the corporation owns holdings. It is stated that the company plans to construct fifty ships at one time.



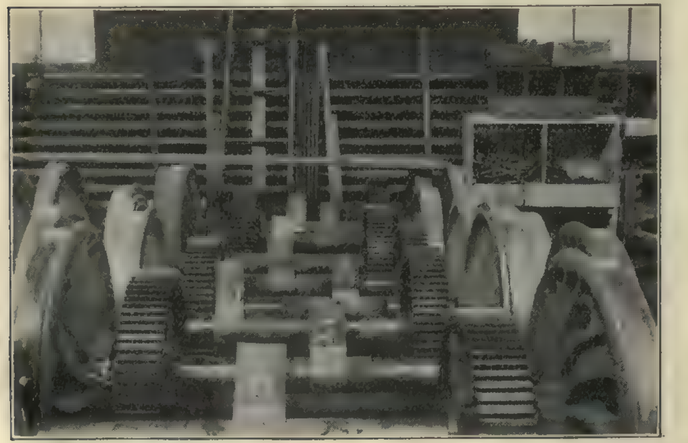
LOUISVILLE RAILWAY CONDUCTOR'S SEAT IN TWO POSITIONS

Conductor's Folding Seat

Folding seats have been installed on pay-as-you-enter cars of the Louisville Railway for the use of the conductors. The seat is of wood pivoted between two vertical members of the prepayment railing and supported at the front by a wooden leg hinged to the seat. When not in use the seat folds down between the vertical stanchions, and the supporting leg folds upward, as shown in the illustration. The seat thus occupies no platform space when not in use.

Marking Spare Axles to Save Time

A means of quickly selecting the proper spare axle and wheels without the necessity of stopping to measure journals, gears, etc., has been used to advantage in the shops of the Colorado Springs & Interurban Railway. The man who has turned the journals or done other work on the wheels and axle knows for what type of truck, motor, etc., that spare axle is fitted, and when he has finished his work on it he marks with white chalk one or two symbols on a steel spring clip which is sprung over the axle, as shown in the accompanying photograph. For instance the first tag with the letters "LB" designates this axle and wheels for a low-geared motor on a Brill truck, while the "BH" tag indicates a spare axle fitted for a Brill truck and high-geared motor; and "H-67," one for high-geared axle for use with GE-67 motors, etc.



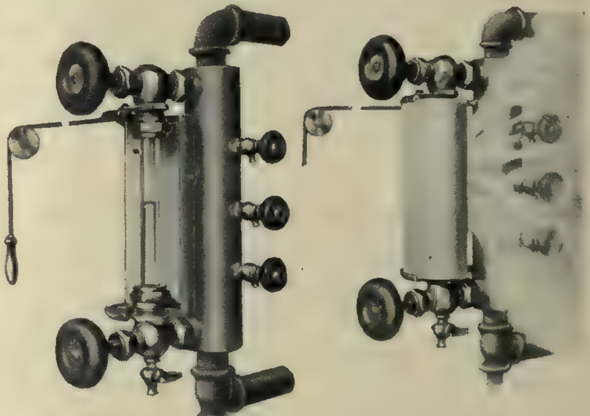
SPARE AXLES TAGGED TO FACILITATE PROPER SELECTION

Thus when a car comes in for axle repair, or renewal of gears or wheels, the proper spare axle and wheels can be taken from the stock and put on the car without any time being lost in measuring the proper set for replacement.

Guard for Use in Replacing Broken Water Gage Glasses

To protect the operator from escaping steam when changing a broken gage glass the Simplex Safety Boiler Gage Glass Company, Springfield, Mass., has placed on the market the guard shown in the accompanying illustration.

It consists of a sheet-metal semi-cylindrical shutter mounted so that it can be rotated by pulling a cord at a distant point. In case the gage glass breaks, the operator pulls the cord, thus moving the shutter through half a turn. This deflects the escaping steam and makes it possible to shut off the gage valves without danger to the operator. This done another pull of the rope removes the shutter from the tracks on which it runs and it drops out of the way so that the gage glass can be changed. The shutter is replaced in the guarding position to protect the operator in case the new glass should break when the gage valves are opened again. When not in guarding position the shutter acts as a reflector.



TWO VIEWS OF GUARD FOR WATER GAGE GLASSES

Method for Removing Tight Wheels

A ring gas burner has solved the problem of removing extra tight wheels in the shops of the Knoxville Railway & Light Company. By means of this burner, which is 8-in. in diameter and has a double row of holes, it is possible to heat wheels sufficiently in about five minutes to make them easily removable. Before this method was used a wheel press of 80-ton capacity at times failed to remove a wheel that had been put in place at a pressure of 45 tons. In these cases it was necessary to send the wheels to a railroad shop for removal.

F. L. Hinman, master mechanic New York State Railways, Syracuse Lines, reports that the portable A-shaped shop ladders, described in the issue of the Electric Railway Journal for March 17, 1917, page 507, have become so popular that a dozen additional ones are being made for the carhouse inspection pits.

London Letter

The Tramway Notes This Month Are Concerned Largely with Increasing Costs and the Growing Need of Additional Sources of Revenue

(*From Our Regular Correspondent*)

The growing difficulty of municipal finance owing to enormously increased cost of materials may be gathered from the experience of Manchester. There, as in Sheffield, the trams have been earning more money than ever before in their history, but the amount available for rate relief has had to be cut down by one-half. The total revenue for the year was £978,000, the largest sum in the history of the undertaking. The contribution to the rate-relief fund, however, falls from £100,000 to £50,000. It is anticipated that it will necessitate an increase of 6*d.* in the pound on the rates. Materials of all kinds are costing very much more than formerly, and labor was never before so dear. War bonuses and allowances are taking from the Manchester trams £103,000 a year. Sheffield, thanks to very careful management and a constantly growing income, which now is the largest on record, has to a certain extent been more fortunate. Still, the expenditures there have mounted so much faster than the revenues that they are face to face this year with a deficiency of about £6,000, and with a probable considerably higher deficiency next year, so that some change in the scale of fares in the near future would appear to be inevitable.

With respect to tramway fares in Dundee it was decided at a recent meeting of the tramway committee that no alteration be made. The convener stated, however, that it would be necessary to consider the whole position of the tramways especially as the accepted tenders for stores for the coming year were at much higher figures of cost than the present ones. It was proposed that under the present war conditions the interest received on investments to the credit of the tramway department should, for this year and next year, be available to help to pay the interest on the remaining debt on the undertaking, any balance not required to go to the renewal fund.

The Nottingham tramways committee contemplates the adoption of several restrictions in the hope of enforcing economy. Increases of wages, the war bonuses, and the enormously enhanced cost of administration and maintenance are stated to have rendered it absolutely necessary to retrench. It has been suggested that the system of transfer tickets be suspended during the period of the war (thus apparently to stop the halfpenny fares); that the half-fare age of school children be reduced from fifteen years to twelve years and that the hour at which workmen's tickets are available be limited to 7 a. m. It is expected that these changes will meet with considerable opposition, but the finances of the undertaking have been so seriously affected by war conditions that some curtailment of facilities is deemed to be inevitable.

A special meeting of the Belfast City Council has been held to receive the recommendation of the tramways and electricity committee with regard to fares and stages for the ensuing year. The minutes of the committee contained a statement of the revenue account of the tramway undertaking for the year ended March 31, 1917. This showed that the receipts amounted to £301,245, the largest revenue on record, but that the working expenses of £189,665 were also a record. The capital, depreciation, and other charges amounted to more than £119,000. This was also a record. The net result of the year's working was a deficit of £6,892. The estimate of the city accountant for the next financial year based on present fares and expenses placed the revenue at £303,000 and the deficiency at the end of the year at £23,000. The committee recommended the abolition of all privilege tickets and free passes, with the exception of those issued to tramway employees going to and returning from duty, the withdrawal of return tickets, the limitation of work-people's tickets to before 8 a. m. and to the special workmen's cars in evening and at midday on Saturdays, and the readjustment of children's fares.

At a meeting of the Newcastle Corporation tramways committee, the application from car workers for an increase of 5*s.* a week in wages was considered. After discussion, the committee granted an advance of 4*s.* a week to motormen, male conductors, male cleaners, and others, and an advance to women conductors of 1*s.* per week extra pay at the end of six months and another 1*s.* twelve months hence. The women car cleaners on night duty are to have their wages advanced by 2*s.* per week. It was decided that the additional war bonus of 2*s.* per week to men who have worked seven days a week, and of 1*s.* to women who have worked six days, shall be continued. The increases represent an annual charge of £4,967. A further sum of £3,770 will be required to meet the advances granted to other employees as a result of the recent award of the committee on productions.

Between 4000 and 5000 women tramway workers including conductors, trolley girls and cleaners, employed by the Lancashire and the Cheshire corporations and private tramway companies have been awarded a war bonus of 3*s.* 6*d.* for workers eighteen years and over, and 2*s.* for girls under eighteen, by the committee of production. The claim made by the Lancashire Districts Council, a body representing the workers, was for a bonus of 6*s.* 6*d.*, the amount of bonus now paid to the men employed. It was contended that this claim was reasonable, because the women, on whose behalf it was made, were doing the work of men who receive the higher bonus. On behalf of the corporations and the private tramways it was urged that while the majority of the men engaged were married and had dependents, the women workers were for the most part unmarried.

The tramway committee of Edinburgh Town Council has received a letter from the Admiralty stating that it is in favor of the proposed construction by the Corporation of Edinburgh, after the war, of a tramway between Edinburgh and South Queensferry. This will be beneficial to Rosyth, and the Admiralty will support the corporation in any application for a provisional order or bill, provided there is no actual construction carried out during the war.

The London Electric Railway has applied to the Board of Trade for an extension of time in which to construct the surface railway from Golders Green through Hendon to Edgware. This line is to link up with the Charing Cross and Hampstead Tube.

Sir Albert Stanley, who in consequence of his appointment as president of the Board of Trade resigned from the companies forming the London Underground group, including the General Omnibus Company, has been succeeded by C. W. Burton, who will act as managing director. The properties include the Underground Electric Railways of London, Ltd., the Metropolitan District Railway, the London Electric Railway, the Central London Railway and the City & South London Railway.

Now that the tramways committee of the Birmingham City Council is under the necessity of still further curtailing the omnibus services in the city, owing to the shortage of petrol, a question has arisen as to the effect this reduction will have on the provision made for the conveyance of wounded soldiers. The tramway department has carried wounded soldiers free of charge on all the tramway and omnibus routes of the city, but as the vehicles were so much in demand for the convenience of persons employed in the manufacture of munitions, as well as for the ordinary traveling public, appeal was made to the authorities at the war hospitals with the result that the wounded soldiers were asked not to travel in batches of more than six.

The report concerning the working of the Liverpool Corporation electric tramways for the year 1916 shows that the total revenue was £766,577. The total operating costs were £518,037 and the gross profit, £248,540. The net profit, after making provision for interest—£49,834—and sinking fund and repayment of loans—£52,735—was £145,971. This is an increase of £22,777, as compared with that of the year 1915. The feature of the tramways is the extremely cheap system of fares. In the industrial portions of Liverpool passengers are allowed to travel 3 miles 207 yards for 1d. at all periods of the day, without restriction. During the period under review the staff was seriously depleted. Out of a total of 2700 no fewer than 1900 have left to join the forces. The vacancies thus created were as far as possible filled by men incapable of military service, or by women. This class of labor has, states the report, performed the duties as well as could be expected under the circumstances.

A. C. S.

News of Electric Railways

Traffic and Transportation
Financial and Corporate
Personal Mention
Construction News

Boston Elevated Obtains Some Relief

$500,000 Fund Returned by State—Bond Issue Authorized—Cambridge Subway Purchase by State Voted Down—Commission to Investigate Further

Partial relief for its financial needs was assured the Boston (Mass.) Elevated Railway by an act passed during the closing hours of the Legislature on May 25. The act provides for the return of $500,000 by the State to the company within ten days, this being a guaranty fund maintained by the railway since the early days of its rapid-transit construction. The company is authorized, subject to commission regulation, to issue bonds or notes not exceeding 20 per cent of the cash paid in by its stockholders to buy new cars, to replace or retire equipment, and to provide for the first three years' rental of the Dorchester tunnel. Such bonds or notes must be retired within fifteen years of their issue date. Land may be taken by the company for the establishment of prepayment areas, subject to the jurisdiction of the commission. An extension or rearrangement of the East Boston tunnel outlet at Maverick Square to provide for the establishment of a prepayment area is also provided for by the Legislature in this act.

Public Ownership Plan for Subway Fails

A few hours before the prorogation of the session Governor McCall sent a special message to the Legislature urging that the section of the relief bill providing for the purchase of the Cambridge subway by the State be eliminated, and that the Public Service Commission be authorized to regulate the fares of the company. This involved the repeal of the 1897 act establishing a 5-cent fare unit on the Boston system. After a vigorous contest the Governor's proposed amendment was lost, the opponents contending that more time should be granted for investigation of the necessity for abrogating the company's contract with the State. As finally passed, the act provides that the Public Service Commission shall before the 1918 session investigate the advisability of granting higher fares and study the possibilities of further economies in operation.

Governor McCall pointed out that the relief bill contained a provision for the State purchase of the Cambridge subway for about $9,000,000. This obligation was to have been met by the issue of bonds bearing interest at a rate of not more than 4 per cent. At the time when the special commission on Boston Elevated financial needs reported in favor of the purchase conditions were normal. In Governor McCall's opinion, however, it might well be doubted whether the commission would have recommended the purchase if it had known that the country would be involved in a great war, with the first duty upon citizens of conserving the high credit of the commonwealth for use, if necessary, in the common defense.

Governor Against Public Ownership

Quite aside from considerations growing out of the present crisis, however, Governor McCall felt that it would be an unwise policy to use the credit of the commonwealth to purchase any property of the Boston Elevated Railway. The purchase of the subway, instead of settling the difficulties of that company, would, it is likely, only involve the commonwealth, and, unless further legislation were had, might force it to take over the whole Boston Elevated Railway System. Furthermore, said the Governor, the policy upon which this bill would lead the commonwealth to embark would almost inevitably be followed by similar ventures, by an enormous increase in the public debt, and by the creation of conditions which citizens would not care to contemplate.

Regarding the extension of Public Service Commission control over the fares of the Boston Elevated Railway, Governor McCall said:

"The commission is a body created for the express purpose of supervising our transportation systems and of doing justice between those who operate them and the public. The transportation companies should be required to give rates that are just and reasonable and equal to the public. On the other hand, they should be permitted to receive rates which would enable them to pay reasonable wages to their employees, to operate their property efficiently, and to yield a return upon investments honestly made. Less than that would not pay for the fair cost of the service.

"The substantial elements in the cost of transportation upon this system can be quickly determined. There is no necessity for an inquiry long drawn out to determine the cost to the minute fraction of a mill. If the commission is equipped with full authority in the premises, I believe it will take seasonable action, and action which will receive the public approval. The maintenance of this system is of very great public importance. It has a body of highly-trained employees, led by a man who is recognized throughout the country as one of the foremost men in his calling. It gives a very good service now; it should be enabled to give even better service in the future, and I believe that it will be able to do that under the efficient management which it now has and the full regulation of the Public Service Commission."

Short Municipal Elevated Suggested

Ordinance Introduced in Seattle Council Would Provide for an Elevated Line, a Ferry Terminal and Common User Rights

An ordinance introduced by Oliver T. Erickson in the City Council of Seattle, Wash., provides for the construction by the city of an elevated railway in order to connect Division A and the Lake Burien municipal railway lines, and provide a street railway terminal for the Port of Seattle's proposed ferry line from the West Waterway industrial district. The ordinance directs the city engineer to furnish an estimate of the cost of the line suggested.

In the resolution Councilman Erickson recites that the transportation facilities on the East and West Waterways are hampered and checked in activity and growth because of inadequate transportation for their employees; that an elevated on Whatcom Avenue would be profitable because of the enormous traffic on that street and the speed which could be made in handling cars.

In announcing his plans for a greater municipal railway system for the city of Seattle Councilman Erickson stated that he favored making arrangements with the Seattle & Rainier Valley Railway whereby the cars of that system might run in the rush hours of the morning and evening along the elevated line into the heart of the shipbuilding district. He said that the municipal elevated line could be constructed at comparatively little expense provided the port commission granted permission for use of its right-of-way. The use of the Seattle & Rainier Valley Railway will cost the city $1,000 a month.

Mr. Erickson's plan is for the city to exercise common user rights over the Seattle & Rainier Valley line. Along Whatcom Avenue the plan calls for the construction of the elevated line above the right-of-way granted the Port Commission for a belt line railway. At the foot of Washington Street the plan proposes a public terminal, a slip for the West Waterway ferry, and the exchange of transfers between city lines and the Port ferry.

Salt Lake Labor Questions Settled

War-Time Adjustment Reached—Recognition of Union Waived

The differences between the Utah Light & Traction Company, Salt Lake City, Utah, and its trainmen have been adjusted. The negotiations had been in progress for weeks. The old schedule was 28 cents for the first year and 33 cents thereafter. The men demanded 37 cents the first year, 42 cents thereafter and recognition of the union. The company refused to meet either of these demands. A strike seemed imminent. Two weeks ago the county commissioners of Salt Lake County called both sides together and urged them as a patriotic duty to settle the differences by arbitrating all arbitrable matters and waiving the others during the war. Both sides accepted this principle and negotiations were renewed. On May 24 a one-year agreement was made. The wage schedule was fixed at 28 cents for the first year, 34 cents for the second year and 37 cents for the third year. The question of union recognition was waived. Both sides have agreed for one year and during the pendency of the war to refer the other differences between them to arbitration. If they are unable to agree on the question of what are arbitrable subjects, then the State Industrial Commission is to decide the matter. The labor situation has thus been satisfactorily settled for the period of the war. The question of recognition of the union may, however, come up for adjustment thereafter.

South Bend Mediation Fails

Arbitrary Stand of Men Prevents Adjustment by Board Appointed by Governor

The board of mediation in the South Bend wage matter has announced its failure to bring about any settlement. The board was appointed on May 22 by Governor Goodrich of Indiana at the request of Mayor Keller of South Bend, to try to bring about an agreement between the company and those of the striking trainmen of the South Bend city lines of the Chicago, South Bend & Northern Indiana Railway who refused to return to work under the new wage schedule and working conditions which were accepted by 80 per cent of the employees.

The board began its work at South Bend on May 23, behind closed doors. Many of the trainmen, both union and nonunion men, were called and testified before the board. Charles M. Murdock, Lafayette, vice-president of the Chicago, South Bend & Northern Indiana Railway, spent several hours with the board of mediation on May 24 and informed it that the company was willing and intended fully to live up to its contract with the employees. The company's position in the controversy was that the men should return to work as individuals, and that the company could not recognize any negotiations with the union.

It was reported that the men had indicated their willingness to go back to work on a wage scale of 23 cents to 28 cents an hour graduated over a five-year period. This is 3 cents an hour higher than the wages paid before the strike of April 28. The company granted an increase of 2 cents an hour to all its employees shortly after the strike call. This was accepted by the majority of the South Bend trainmen and all the city trainmen in Elkhart, Michigan City and Goshen. The last mediation board meeting was practically a continuous session lasting from noon of May 25 to about 5 p.m. on May 26. At almost the last hour, amended demands were presented by the union men. These were rejected by officials of the company.

An attempt to bring pressure to bear on the company was seen in an order issued by Mayor Keller that the city would no longer provide special policemen for the protection of the cars and employees of the company. Cars are being operated on schedule on all lines in South Bend, and the patronage is now practically normal.

The board announced after its adjournment that the striking employees had conceded that the company should not recognize the union, but still demanded an increase of 1 cent an hour over the new schedule of 22 to 27 cents an hour which has been adopted by the company.

Hearing on Philadelphia Bills

P. R. T. Presents Its Case Before Joint Legislative Committee—Further Conferences Suggested

A hearing was held at Harrisburg, Pa., on May 29 before the joint legislative judiciary general committee to afford the Philadelphia Rapid Transit Company interests an opportunity to reply to the arguments made a week ago by the city of Philadelphia and others in favor of the pending rapid-transit measures. There are three bills before the Legislature in the interest of the city. Their purport is to give the city the power to take over the lines of the Philadelphia Rapid Transit Company by exercising the right of eminent domain, compensation to be fixed by the Public Service Commission; a constitutional amendment increasing the city's borrowing capacity so as to provide this compensation, and the so-called Salus bill to provide through routing of the city's lines on the Philadelphia Rapid Transit Company's lines and also to empower the commission to decide the question of fares and transfers.

The opinion seemed to prevail after the meeting that the measures are doomed to be defeated. Mayor Smith is reported to have urged both Senator Vare and Senator McNichol of Philadelphia to advance the Salus bill in accordance with promises which he claimed were made by the Senators to him. As opposed to this, Senator McNichol suggested that the representatives of the city and the company get together and reach an agreement. Subsequently E. T. Stotesbury, Thomas E. Mitten and Ellis Ames Ballard, of the Philadelphia Rapid Transit Company delegation at Harrisburg, made overtures to William Draper Lewis, Joseph P. Gaffney, chairman of the finance committee of the Councils of Philadelphia, and Transit Director William S. Twining of Philadelphia to the effect that the plan of Senator McNichol be put into practice.

Mr. Stotesbury opened the discussion with a statement in which he reviewed his connection with the company. He then summarized the terms of the 1907 contract and said that after ten years of operation under that contract it now became necessary as a result of the city's decision to construct additional transit facilities to amend in some respects the relation between the parties to the contract. Apart from any contractual rights in the matter, the citizens could best be served if the new city lines were operated in conjunction with the present system of the Philadelphia Rapid Transit Company. With this object in view negotiations were begun by the parties to the 1907 contract for an amendment to that contract. While these negotiations were pending bills were introduced in the Legislature to relieve the city from the obligations of the 1907 contract. The unfairness of this proceeding was obvious. He considered the breaking of one contract a poor foundation on which to build a new one.

BILLS A GROSS ABUSE OF POWER

Mr. Trinkle of counsel for the company said that it would be a gross abuse of power for the Legislature to abrogate the 1907 contract. He predicted that the passage of the bills now pending and any attempt on the part of the city to act in pursuance of the provisions of the bills would mean years of litigation leading up to the Supreme Court itself. He also attacked the feature of the bills by which the Public Service Commission is made an agency to determine valuation in a proceeding in which the city attempts to condemn transit facilities.

Mr. Schaffer for the company also opposed the eminent domain bill. He questioned, first, the constitutionality of the legislation and, second, the means by which the lines could be condemned in townships. Mr. Schaffer declared the bills to be a violation of a contract between the city of Philadelphia and the Philadelphia Rapid Transit System. The Legislature was asked to pass bills which would force the company to take conditions which the city wanted to give and none others.

It was at this point that Senator McNichol made his suggestion for further conferences. To this proposal Mayor Smith, who was not at Harrisburg, later said that any time a new proposition which looked toward an agreement between the city and the company was offered to him he was ready to receive it. He had interpreted Mr. Stotesbury's remarks made at the public hearing in Philadelphia, to which reference was made in the ELECTRIC RAILWAY JOURNAL of May 26, page 971, as purporting to mean that the present contract was the only one which the company was willing to consider.

The bills were defended for the city by Dr. Lewis. He expressed the opinion that they were constitutional and replied briefly to each of the objections raised by opposing counsel.

Detroit Arbitration Award

New Wage Scale Fixed—Representative of Men on the Board Refused to Sign the Finding

The arbitrators considering the differences between the Detroit (Mich.) United Railway and its men over the question of wages and working hours handed down their decision on May 31. The new wage scale is 30 cents an hour for the first three months; 35 cents for the next nine months, and 40 cents after the first year. The old scale was 27½ cents for the first six months; 32½ cents for the succeeding eighteen months and 35 cents after two years' service. Very slight changes were made in the working hours. The agreement was signed by John Russell, representing the company, and Judson Grenell, the umpire. Judge E. J. Jeffries, representing the men, refused to sign. The pay increase amounts to practically $600,000 a year. The advance in the wages, the increased cost of supplies and the expanding maintenance charges, etc., mean a very large increase in the expenses of the company and indicate that the days of seven-for-a-quarter tickets in Detroit are numbered.

Illinois Storm Damage

Public Service Properties in Mattoon and Vicinity Only Slightly Damaged

The recent tornado in the Central West spent considerable of its force in the city of Mattoon, Ill., and vicinity in which the Central Illinois Public Service Company, a subsidiary of the Middle West Utilities Company, operates. The president of the Central Illionis Public Service Company is M. E. Sampsell, Chicago, and he was in Mattoon continuously for several days following receipt of the news of the storm as received in Chicago. The Mattoon papers of May 28 said nothing about the damage to the railway or electric properties at Mattoon operated by the Central Illinois Public Service Company. Mr. Sampsell was not expected to return to Chicago until Decoration Day.

A telegram received on May 28 by Martin J. Insull of the Insull interests in Chicago, which control the Middle West Utilities Company, contained the only information had in Chicago at that time about the effect of the storm on the Middle West properties. This telegram said that only a very small percentage of the territory or business of the Central Illinois Public Service Company was in the storm area. In Mattoon the damage was very slight. The Mattoon plant has been operating since shortly after the cyclone. All transmission lines of the Kincaid plant west and also east of Mattoon were then in operation, and repair work had been started on the line from Mattoon to Charleston. The plant in Charleston was damaged, but it was expected to restore electric service in the Charleston plant that night (Monday). The telegram said that considering the severity of the storm, the properties of the Central Illinois Public Service Company in the storm center were very fortunate in their escape from any serious damage.

Providence Labor Conferences Continue

The agreement between the Rhode Island Company, Providence, R. I., and its employees expired at midnight on May 31, but it is asserted by union officials that the negotiations now being conducted will be continued and that a decision may be reached by July 1. In the meantime there will be no strike, it is stated, and no attempt to force a quick decision.

In the draft of a new agreement submitted by the union officials there are 130 separate sections, each taking up some point of the controversy over wages, hours, runs, working conditions, overtime, and other matters. The agreement which has now expired contained only thirty sections.

Two sessions of the conferees are held at the company's office every day except Saturday. By mutual agreement the old agreement will be continued in force until the conferees reach a decision.

Fire in Lexington.—Fire which destroyed two-thirds of a city block of property at Lexington, Ky., on May 21, entailing a loss of $500,000, in no way affected the traction, light and power service of the Kentucky Traction & Terminal Company.

El Paso Employees Admit Strike Failure.—The strike of conductors and motormen on the El Paso (Tex.) Electric Company has been called off. This was merely a formality, as the strike had long since passed into history so far as the company was concerned.

Pay of Cumberland Employees Increased.—The Cumberland (Md.) Electric Railway has entered into an agreement with its employees under which they will receive an increase in pay of 3 cents an hour. The contract is to run for two years and is to date back to May 1.

Help Difficult to Secure.—Such extreme difficulty is being experienced by the Portland Railway, Light & Power Company, Portland, Ore., in securing candidates for positions as trainmen that the offices of the employment examiner will be kept open until 9 o'clock p. m., to receive applications.

Kansas City Shopmen and Others Receive Wage Increase.—The Kansas City (Mo.) Railways has recently awarded wage increases of 2 cents an hour to many workmen in the plant, substations and shops, chiefly those who had not shared in the previous advance in wages made by the company.

Increase in Wages in Harrisburg.—The Harrisburg (Pa.) Railways has announced an increase in wages of 2 cents an hour effective on June 1 for all motormen and conductors. The company will also readjust the wages of its other employees. The maximum wage of the Harrisburg Railways for motormen and conductors is 30 cents under the new order.

Municipal Ownership Inopportune.—That the present time is inopportune for Windsor, Ontario, to adopt municipal ownership and buy the system of the Sandwich, Windsor & Amherstburg Railway, a subsidiary of the Detroit United Railway, is the opinion offered by officials of the Ontario Hydroelectric Commission to Mayor Tuson and a delegation of Windsor aldermen.

Illinois Home Rule May Not Be Passed.—There has been no news of importance on the local Chicago traction situation as it now stands before the State Assembly as reviewed in the ELECTRIC RAILWAY JOURNAL of May 19, page 927, except accumulating evidence to indicate that the home rule bill will probably not be passed. As pointed out previously, further progress in the solution of the Chicago problem depends upon the action of the Legislature.

Increase in Wages in Elmira.—The trainmen in the employ of the Elmira Water, Light & Railroad Company on its lines in Elmira, N. Y., Horseheads and Elmira Heights have had their wages increased 10 per cent at an additional yearly expense to the company of between $17,000 and $18,000. In the past the men received from 21½ cents an hour the first year to 25½ cents for the fifth year. The new scale provides for the payment of 24 cents the first year and 28 cents the fifth year.

Tripper Controversy Settled.—The differences between the New York State Railways and the Amalgamated Association over the question of tripper operation have been settled. Hereafter men on extra runs will receive a minimum of six hours' pay a day, and regular men on short runs will receive a minimum of nine hours' pay a day. The agreement covered by these conditions was reached between James F. Hamilton, general manager of the Rochester lines of the company, acting as arbitrator for the company, and James E. Roach, general organizer of the American Federation of Labor, arbitrator for the men. Messrs. Hamilton and Roach settled the matter in conference between themselves without the need of a third member, as provided in the arbitration agreement.

Wage Increase, Insurance and Pensions Announced.—Notice was posted on May 20 in the carhouses of the Duluth (Minn.) Street Railway that wages will be increased, life insurance furnished free of charge, and pensions granted to the employees. All employees who have been with the company one year or more will receive the life insurance policies. Each policy will be equal to one year's salary of the employee insured. All employees of the company of more than one year's service will be granted an extra war bonus check each pay day in the future, the amount to be equal to 5 per cent of the employee's regular check. Employees of less than one year's service will receive extra pay equal to 10 per cent of their salary. The increase in pay will continue during the present era of extraordinary prices. The details of the pension plan will be announced later.

Test of Validity of Cincinnati Grant Proposed.—On request of the Cincinnati (Ohio) Rapid Transit Commission, Prosecuting Attorney John V. Campbell of Hamilton County will bring quo warranto proceedings in the Ohio Supreme Court to test the validity of the act and ordinance under which the commissioners are to operate in leasing the proposed rapid-transit loop to the Cincinnati Traction Company. This step was taken to eliminate once for all the legal attacks that have been made from time to time. Mr. Campbell notified the board that he will make the commission, the Cincinnati Traction Company and the Cincinnati Street Railway parties defendant in the proceedings. He also requested that attorneys for the commission notify counsel for the railways so that they may be prepared to present their side of the case when a hearing is called, presumably some time in June.

Wage Increases on I. T. S.—The Illinois Traction System has voluntarily granted an increase in wages amounting to 10 per cent to city trainmen employed on its local street railway lines in Danville, Decatur, Champaign-Urbana and Bloomington, Ill. The present contracts with employees in these cities were not to have expired until Aug. 1, 1918. The new schedules are for a term of two years. They provide for a nine-hour day, and the wage is divided into six steps, increasing year by year until after the fifth year of service. In granting the increase the company urged the men to observe greater economy and care than ever in the operation of cars. The Peoria, Ill., trainmen have made a new agreement with the same company, effective from May 1, 1917, as follows: First-year men, 28 cents an hour instead of 23 cents; second-year men, 29 cents instead of 26 cents; and third-year men and those in succeeding years, 33 cents instead of 29 cents.

Emergency Increase in Wages in Louisville.—Effective as of May 16, the Louisville (Ky.) Railway has granted a special advance of 7½ per cent in wages to carhouse foremen, their assistants, line inspectors, motormen and conductors, who work on the hourly or daily basis or whose salaries are less than $100 a month. This will be in the form of a bonus on wages earned and will be payable on each of the semi-monthly pay days. The step is purely an emergency measure to help the employees named to meet the high cost of living. In making the announcement Samuel Riddle, superintendent of transportation, said: "While the company is itself burdened with an operating cost that has risen to unprecedented heights by reason of increased price of practically every commodity that figures in its business, it has authorized this emergency bonus in consideration of the equally pressing living problem that confronts its employees. It is hoped to continue the bonus during the war or so long as the business of the company will permit. Therefore it is highly important to have the hearty co-operation of every employee in protecting the interest of and reducing expense for the company."

Programs of Association Meetings

Railway Signal Association

A stated meeting of the Railway Signal Association will be held on June 12 and 13 at the Hotel McAlpin, New York City. At this meeting committee reports will be presented on the subjects of signaling practice, standard design, and electric railways and a.c. signaling. A special committee will report upon the harmonizing of existing specifications, and a progress report will be presented by another special committee on the subject of signaling requirements of electric railways, the latter committee having been organized to co-operate with a committee from the American Electric Railway Association.

American Institute of Electrical Engineers

Discussion at a meeting of the board of directors of the American Institute of Electrical Engineers, held in New York on May 18, showed that on account of the national situation many of the active members who usually attend the annual convention would not be able to spare the time this year to go to the proposed four-day meeting at Hot Springs, Va. In view of this fact the directors decided that it would not be feasible to hold the proposed convention at Hot Springs. It has been decided, however, to hold a special two-day meeting in New York on June 27 and 28, for presentation and discussion of papers that were to have been presented at the annual convention.

Central Electric Railway Accountants' Association

The thirty-first meeting of the Central Electric Railway Accountants' Association will be held at the Hotel Anthony, Fort Wayne, Ind., on June 8 and 9. The session on June 8 will be called at 10 a. m. The following reports will be presented: Report of executive committee, report of standing committee on passenger and freight accounts, and report of clearing house committee. At the afternoon session the following addresses will be made:

"Proper Classification for Light and Power Accounting," by A. E. Dedrick, auditor of the Youngstown & Sharon Street Railway, Youngstown, Ohio.

"Work Order Systems, Railway and Light and Power," by A. C. Van Driesen, chief accountant of the Toledo Railways & Light Company, Toledo, Ohio.

The report of the committee on electric light and power accounting will also be presented at this session.

The session on June 9 will be called at 9.30 a. m. The following addresses will be made:

"Maintaining a Light and Power Construction Department," by Karl A. George, auditor of the Indiana Railways & Light Company, Kokomo, Ind.

"Need of Raising the Standard of Qualifications of Men Employed in the So-called Minor Positions of Railway Organizations," by B. H. Jacobs, assistant auditor of the Cleveland (Ohio) Railway.

Central Electric Railway Association

The letter of C. N. Wilcoxon, president of the Central Electric Railway Association, to the members canceling the summer meeting of June 22-25, was dated May 24. His statement was concluded in part as follows:

"In conformity with the pledge made by the association to the President at the annual meeting of the association in March, it devolves upon the electric railways in these times of stress to devote their endeavors to the preparation of their systems for the increased demands, both military and industrial, which in all probability will be made upon them.

"The government is likely at any time to call upon the manufacturers, whose representatives are members of this association, in the furtherance of its military plans, and require their expert assistance in the great struggle which we are now facing.

"The executive committee in canceling the summer meeting does not contemplate that the Central Electric Railway Association will be of any less value to its members in the future than it has been in the past, but that its energy and resources will be applied to the various problems which the present crisis has given and will give rise to.

"Meetings of the executive committee will be held from time to time, upon proper call, to consider subjects of value to the association and to direct its affairs. Whether a business session of the association will be held later will depend upon the trend of events and the opinion of the executive committee."

Financial and Corporate

Annual Report

Portland Railway, Light & Power Company

The comparative income statement of the Portland Railway, Light & Power Company, Portland, Ore., for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	$5,483,109	100.0	$5,511,345	100.0
Operating expenses	2,521,606	46.0	2,542,278	46.1
Taxes	516,648	9.4	531,351	9.6
Total	$3,038,254	55.4	$3,073,629	55.7
Net earnings	$2,444,855	44.6	$2,437,716	44.3
Interest	2,131,287	38.8	2,160,603	39.2
Bridge rentals	46,970	0.9	47,752	0.9
Total	$2,178,257	39.7	$2,208,355	40.1
Surplus	$266,598	4.9	$229,361	4.2

The gross earnings of the company during 1916 decreased $28,236 or 0.5 per cent, but the operating expenses and taxes dropped $35,375 or 1.2 per cent, this being due to decrease of $20,672 or 0.8 per cent in operating expenses and $14,703 or 2.8 per cent in taxes. As a result the net earnings gained $7,139 or 0.3 per cent. Interest decreased $29,316 or 1.4 per cent, and the surplus for the year showed a gain of $37,237 or 16.2 per cent.

In the annual report for 1915 an increase in earnings was predicted, based upon the strong indications of better business conditions which prevailed at the time of making the report. Immediately following the disastrous storms of January and February, 1916, there was a noticeable improvement in earnings of both the railway and electric departments. This improvement bore every indication of permanency, but in May the business depression settled down again and the company showed further decreases in earnings throughout the summer. Because of the long-continued depression Portland lost not less than 10 per cent of its population during the year ending with August, 1916.

In the aututmn, however, conditions began to improve. This improvement has continued. The surplus for January, 1917, was $47,704, as compared with $15,494 for January, 1916, and for February, 1917, the surplus was $35,749, as compared with a deficit of $24,926 for February, 1916.

Jitney competition still exists in the railway department, although the number in operation has been considerably reduced. The maximum number of jitneys operating in Portland was 363 on Dec. 15, 1915. During the last twelve months the greatest number counted on any one day was 272 on Feb. 9, 1916. Excluding two days when there were heavy snowfalls, the smallest number was 152 on Jan. 31, 1917. Notwithstanding the continued presence of the jitneys, the increase in passenger earnings of the city railway lines for the three months ending Jan. 31, 1917, amounted to $70,585, or almost 10 per cent above the same months of the previous year.

The annual report states that there is every reason to believe the earnings of the city railways will continue to increase, chiefly because of the resumption of general business activity, the practical elimination of the non-employment problem, the steady increase in population commencing last fall, and the prospect of further reduction in the number of jitneys due to regulation and the demand for labor. Freight traffic is showing a decidedly healthy increase and promises a much better showing for 1917. This is due to the development of carload freight of a class not easily handled by motor trucks.

Expenditures for extensions and betterments to property during 1916 were as follows: Railway extensions and improvements, $136,158; cars, $8,174; power plants, substations, etc., $36,635; customers' installations, $266,945; Salem gas plant $2,705; real estate and buildings, $30,045, and miscellaneous, $7,059. Total, $487,721.

Merger of New Jersey Companies

The Board of Public Utility Commissioners has approved the application of the Jersey Central Traction Company and the Central Jersey Traction Company for permission to merge as the Jersey Central Traction Company. The capital stock of the Central Jersey Traction Company will be canceled as a result of the consolidation. The Jersey Central Traction Company operates the electric railways in Monmouth County between South Amboy, Keyport, Red Bank and Atlantic Highlands.

In order to conform to the general wishes of the Utilities Commission, by divorcing, so far as possible, the traction from the lighting business, the new company proposed to that body that it give its permission to the company to sell to the Monmouth Lighting Company the power station, transmission lines and substations, and also the stocks, bonds and construction debts of the Middlesex & Monmouth Electric Light, Heat & Power Company. The total value to be transferred in this manner would amount to $701,200. This permission has been granted, upon the condition that the Jersey Central Traction Company will use the proceeds from the sale to retire outstanding securities.

Finally the Board of Public Utility Commissioners announced that it had decided the application of the consolidated company for approval of a mortgage amounting to $5,000,000, the issuance of bonds of a par value of $800,000. and the issuance of preferred stock to the amount of $600,000 and common stock to the amount of $1,000,000, by approving the creation of the $5,000,000 mortgage; the $800,000 bond issue; $600,000 in preferred stock, and common stock to the amount of $531,400.

In another report the board decided it would approve the application of the Monmouth Lighting Company and the Middlesex & Monmouth Electric Light, Heat & Power Company to merge and consolidate. The result will be to divorce the electric lighting business from the traction business and put the control of the generating plant and the substations in the hands of the lighting company.

Reduction in Light and Power Rates

The Public Service Commission of Oregon on May 21 issued an order affecting residence lighting and commercial power rates of the Portland Railway, Light & Power Company, to become effective within twenty days. One important feature of the rate reduction lies in the fact that while the minimum lighting charge stands at $1, as at present, the consumer of residence lighting will receive 1½ kw.-hr. more service for the minimum charge than he now does. Franklin T. Griffith, president of the company, said that the probable effect on the revenues of the company had not been estimated, but that the loss certainly would be not less than $50,000 a year.

On April 30 the commission, after valuation proceedings lasting more than three years, handed down its decision fixing the value of the railway, electric utility and gas utility divisions of the company for rate-making purposes. The total, as fixed for all three, was $46,862,972. As noted in the ELECTRIC RAILWAY JOURNAL for May 12, page 885, this was divided as follows: Railway, $27,159,021; electric utilities, $19,492,152; Salem gas utility, $211,798.

"No Par Value" Bill Signed

Governor Whitman of New York has signed the Walters-Pratt bill, which affords an easy and effective method of changing the shares of stock of an existing corporation from stock having a fixed par value to shares having no par value. The bill adds five new sections to the stock corporation law. Sections 19 to 23, inclusive, of the stock corporation law, enacted at the instance of the New York State Bar Association in 1912, permitted the inclusion in the original charter of corporations thereafter formed or reorganized of a provision for the issuance of shares without par value. It failed, however, to provide any method by which a corporation that had already been formed could be reorganized so that it could obtain the full benefits of the new law without first going through the process of dissolution. The popularity of the "no par value" features of New York's corporation law is shown by the revenues which have been derived from fees and taxes on the organization of corporations of this particular type, already reaching a sum in excess of $1,500,000.

Bonds to Purchase Street Railway

Toledo Committee Wants to Put Purchase of Railway Property Before Voters

The committee on rules and by-laws of the City Council of Toledo, Ohio, has approved a resolution which provides for submission to the voters at the August primaries of an amendment to the city charter that proposes to legalize the issuance of negotiable bonds and pledge the taxing power and general credit of the city as security. It also contains a provision for asking the voters to approve a bond issue of $3,000,000 at the November election, the proceeds to be used in the purchase of the street railway property of the Toledo Railways & Light Company.

Boston (Mass.) Elevated Railway.—As noted on page 1018 elsewhere in this issue partial relief for its financial needs was assured the Boston Elevated Railway by an act passed during the closing hours of the Legislature on May 25. The act provides for the return of $500,000 by the State to the company within ten days, this being a guaranty fund maintained by the company since the early days of rapid-transit construction.

Buffalo, Lockport & Rochester Railway, Rochester, N. Y.—A. S. Muirhead, W. H. Nesbitt and R. C. Vaughan, Toronto, Ont., have been elected directors of the Buffalo, Lockport & Rochester Railway to succeed E. R. Wood, F. A. Dudley and C. D. Beebe.

Cape May, Delaware Bay & Sewell's Point Railway, Cape May, N. J.—A dispatch from Cape May to the Philadelphia *Public Ledger* of May 30 said that the Cape May, Delaware Bay & Sewell's Point Railway, extending along the beach front from Sewell's Point to Cape May Point, which was sold at receiver's sale in April, has been taken over jointly by the Pennsylvania Railroad and the Philadelphia & Reading Railway. The road has not been operated since last September, when the receiver was appointed. It is expected to resume service about June 15.

Hagerstown & Frederick Railway, Frederick, Md.—The Maryland Public Service Commission has approved the readjustment of the finances of the Hagerstown & Frederick Railway, recently sanctioned by the stockholders and referred to in the ELECTRIC RAILWAY JOURNAL of May 19, page 934, and May 12, page 891.

Interborough Rapid Transit Company, New York, N. Y.—The New York Public Service Commission for the First District has adopted an order permitting the Interborough Rapid Transit Company to sell $11,436,000 face value of 5 per cent gold bonds under that company's first and refunding mortgage. The proceeds of the bonds are to be utilized toward meeting increased expenditures over estimates of 1913 in connection with the third-tracking of the elevated railroads in Manhattan and the Bronx. The original application of the company was for $16,436,000, but $5,000,000 of this sum was not allowed at the present time for reasons advanced at length in the opinion approved by the commission.

Interurban Railway & Terminal Company, Cincinnati, Ohio.—Common Pleas Judge Cushing, at Cincinnati, Ohio, has authorized the abandonment of the Interurban Railway & Terminal Company's line between New Richmond Pike and Three-Mile Road, near Cincinnati and the village of Bethel in Clermont County, and has ordered Receivers Charles M. Leslie and Charles S. Thrasher to sell the tangible assets of this portion to the Clermont Construction Company, which owns a controlling interest in the Cincinnati, Georgetown & Portsmouth Railway. Bondholders had agreed to the sale, as several years' operation by the receivers had been unsatisfactory in the way of income. Business interests and residents along the line threatened to appeal to the higher courts, but Judge Cushing announced that the appeal bond would be $25,000 in case it was desired to take such action. The court advised that the matter of another line be taken up with the Cincinnati, Georgetown & Portsmouth Railway. Under the terms of the purchase payment is to be made by the transfer of $240,000 of the first mortgage bonds and $433,000 of the common stock of the Cincinnati, Georgetown & Portsmouth Railway, taken at par.

Jefferson County Traction Company, Beaumont, Tex.—An election will be held at Beaumont on July 10 to vote on the proposed merger of the Beaumont Traction Company, the Beaumont Electric Light & Power Company and the Jefferson County Traction Company, to which reference was made in the ELECTRIC RAILWAY JOURNAL of April 28, page 799.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—The application of the Kansas City, Kaw Valley & Western Railway to issue $66,000 in first-mortgage bonds, $41,500 in general mortgage bonds and increase its capital stock $58,000, has been denied by the Kansas Public Utilities Commission. The Kansas City, Kaw Valley & Western is building from Kansas City to Topeka. It was discovered, after the utilities commission had given it permission to issue bonds with which the line from Bonner Springs to Lawrence was to be constructed, that the line was 3½ miles longer than was supposed. The application for an increase in the amount of securities applied for originally was asked because of this and for the building of sidetracks and switches. The company wanted the same amount for sidetracks as for the main line. The commission considered this requested increase excessive and denied it.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio—The stockholders of the Mahoning & Shenango Railway & Light Company will vote on June 14 on the question of ratifying a proposition looking toward the consolidation of certain subsidiaries for the purpose of eliminating unnecessary taxation. The proposal is entirely in the interest of intercorporate simplicity. The companies to be merged into the Mahoning & Shenango Railway & Light Company are the Mahoning Valley Southeastern Railway, the Poland Street Railway, the Youngstown Park & Falls Street Railway and the Youngstown & Sharon Street Railway.

Mansfield Public Service & Utility Company, Mansfield, Ohio.—New officers for the Mansfield Public Service & Utility Company have been elected as follows: S. N. Ford, president; Fred Hertenstein, formerly president, vice-president; P. Barnhart, secretary-treasurer. Mr. Barnhart will also act as manager, in which capacity he will succeed S. A. Foltz, formerly secretary, treasurer and general manager. The elected officers and Reid Carpenter and Henry Hoppe are the directors.

Monongahela Valley Traction Company, Fairmont, W. Va.—The Fairmont *Free Press* of May 17 said: "A new plan for the consolidation of the Kanawha Traction & Electric Company and the Monongahela Valley Traction Company was adopted at the annual meeting of the latter corporation held yesterday afternoon. It was discovered that differences existing between the West Virginia and Ohio laws would not permit of the consolidation of the companies under the first plans. The Parkersburg properties will probably be taken over by the Monongahela Valley Traction Company on July 1 instead of June 1, as was first planned." The terms of the merger as proposed originally were published in the ELECTRIC RAILWAY JOURNAL of March 31, page 615.

New York, New Haven & Hartford Railroad, New Haven, Conn.—The bill authorizing the New York, New Haven & Hartford Railroad to issue not more than $50,000,000 of 7 per cent preferred stock at not less than par to pay indebtedness has passed both houses of the Connecticut Legislature and is now before the Governor. The company has also been authorized by the Massachusetts Legislature to continue to own and control the securities of certain companies now in its treasury, provided it performs certain duties imposed by the act. Among the companies so included are the New York, Westchester & Boston Railway and the Providence, Warren & Bristol Railroad. Under the act any Massachusetts street railway which connects with any one of four roads mentioned as owned by the New Haven and situated in Connecticut may purchase or lease such line of railway with which it connects under conditions set down in the present act.

Northern Electric Railway, Chico, Col.—The reorganization committee of the Northern Electric Railway has declared the amended plan of reorganization operative inasmuch as it had been agreed to by a majority of all of the deposited bonds. It was further decided that a penalty of $10 a bond would be exacted from all bondholders who failed to deposit their bonds on or before May 25. Charles M. Levey, president, and John F. Bowie, attorney for the Western Pacific Company, told the committee on May 10 that their company was prepared, if the Railroad Commission should approve, to enter into negotiations for the purchase of the Northern Electric Railway. The reorganization committee has appointed the following sub-committee to consider the proposal: Frank B. Anderson, John S. Drum, John D. McKee, James K. Moffitt and Philip I. Manson.

Port Arthur (Tex.) Traction Company.—The Port Arthur Traction Company has filed in the county clerk's office at San Antonio a first mortgage deed of trust covering all of its property, in favor of the Dayton Savings & Trust Company, Dayton, Ohio, to secure the issuance of $400,000 of first mortgage sinking fund 5 per cent gold bonds. According to the San Antonio *Express* is was announced that the filing of the deed was merely the recording of a transaction made several years ago, which was not properly recorded.

Public Service Railway, Newark, N. J.—The New Jersey State Board of Public Utility Commissioners has approved an equipment trust agreement between Arthur E. Newbold, Philadelphia, Pa., and the Public Service Railway, controlled by the Public Service Corporation of New Jersey. The agreement is for the leasing to the company of 150 trolley cars. The company was to pay $248,500 advance rental on June 1, with a specified semi-annual rental thereafter, beginning on Nov. 30 next. The Philadelphia Trust Company is the trustee under the mortgage securing the cars.

Standard Gas & Electric Company, Chicago, Ill.—The Standard Gas & Electric Company has redeemed, through its sinking fund, an additional $975,500 of convertible sinking fund 6 per cent bonds of an issue of $10,300,000 dated Dec. 1, 1911, and due in 1926. The total amount of these bonds canceled to May 19 is $4,369,500, leaving outstanding a balance of $5,930,500.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The New Jersey Board of Public Utility Commissioners has authorized the Trenton & Mercer County Traction Corporation to issue $66,000 of 5 per cent notes to the Mechanics' National Bank, Trenton, to provide funds to be applied to the purchase of ten new cars.

Washington Water Power Company, Spokane, Wash.—The New York Stock Exchange has added to the list $1,700,000 of first refunding mortgage sinking fund 5 per cent thirty-year bonds of the Washington Water Power Company due July 1, 1939, with authority to add on or before Jan. 1, 1918, $539,000 of additional bonds of that issue, making the total amount authorized to be listed $7,974,000. The funds covered by the new bonds were used for permanent improvements, extensions and additions.

Waycross Street & Suburban Railway, Waycross, Ga.—H. H. Burnet, receiver of the Waycross Street & Suburban Railway, is advertising the property of the company for sale under foreclosure on June 5 to the highest bidder, subject to confirmation by the court. Ten per cent of the highest bid made is to be deposited with the receiver in cash or in the form of a certified check. The property is described by the receiver as consisting of 9 miles of electric railway, nine cars, a carhouse and lot located in Watrusco, Winona Park pavilion and appurtenances and all the rights and privileges under the unexpired term of the fifty-year franchise of the company.

West End Street Railway, Boston, Mass.—The Massachusetts Public Service Commission has approved an issue of thirty-year 6 per cent bonds of the West End Street Railway to an amount not exceeding at par $1,581,000. The proceeds of the new issue will be used to refund a similar amount of bonds which will mature on Aug. 1.

Dividends Declared

American Railways, Philadelphia, Pa., $1, common.

Frankford & Southwark Passenger Railway, Philadelphia, Pa., quarterly, $4.50.

Indianapolis (Ind.) Street Railway, 3 per cent.

Northern Ohio Traction & Light Company, Akron, Ohio. quarterly, 1¼ per cent, common.

Public Service Corporation of New Jersey, Newark, N. J., quarterly, 2 per cent.

Rochester Railway & Light Company, Rochester, N. Y., quarterly, 1¼ per cent, preferred.

Second & Third Streets Passenger Railway, Philadelphia, Pa., quarterly, $3.

United Railways & Electric Company, Baltimore, Md., 2 per cent, preferred.

Washington Railway & Electric Company, Washington, D. C., quarterly, 1¼ per cent, preferred; quarterly, 1¾ per cent, common.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
ATLANTIC SHORE RAILWAY, SANFORD, ME.						
1m., Apr.,	'17	$27,158	*$24,269	$2,889	......	......
1 " "	'16	23,575	*20,703	2,872	......	......
CITIES SERVICE COMPANY, NEW YORK, N. Y.						
1m., Apr.,	'17	$1,609,012	$30,887	$1,578,125	$225	$1,577,900
1 " "	'16	638,491	20,670	617,821	41,631	576,190
12 " "	'17	14,361,932	278,810	14,083,122	86,510	13.996,611
12 " "	'16	5,303,883	181,231	5,122,652	459,333	4,663,319
CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO						
1m., Mar.,	'17	$38,254	*$24,322	$13,932	$11,389	$2,543
1 " "	'16	32,533	*19,987	12,546	11,046	1,500
3 " "	'17	107,053	*68,047	39,006	34,262	4,744
3 " "	'16	93,355	*56,469	36,886	33,158	3,728
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.						
1m., Mar.,	'17	$1,558,538	*$971,164	$587,374	$431,079	$156,295
1 " "	'16	1,353,713	*723,071	625,642	423,203	202,439
12 " "	'17	17,545,338	*9,939,686	7,605,652	5,084,279	2,521,373
12 " "	'16	15,192,163	*8,095,324	7,096,839	4,659,042	2,437,797
GRAND RAPIDS (MICH.) RAILWAY						
1m., Mar.,	'17	$112,738	*$75,658	$37,075	$17 456	$19,619
1 " "	'16	107,618	*67,418	40,200	14,086	26,114
12 " "	'17	1,310,494	*855,330	455,164	196,711	258,453
12 " "	'16	1,200,414	*829,505	370,909	167,168	203,741
KANSAS CITY (MO.) RAILWAYS						
1m., Apr.,	'17	$597,399	*$443,804	$153,595	$129,769	††$41,518
1 " "	'16	575,707	*381,296	194,411	116,375	††52,586
10 " "	'17	6,151,930	*4,125,703	2,026,227	1,300,870	††399,431
10 " "	'16	**				
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO						
1m., Mar.,	'17	$132,542	*$90,386	$42.156	$34,369	$7,787
1 " "	'16	114,646	*78,281	36,365	36,356	9
3 " "	'17	380,290	*273,502	106,788	103,125	3,663
3 " "	'16	334,522	*231,759	102,763	108,791	†6,028
LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.						
1m., Apr.,	'17	$217,984	*$139,570	$78,414	$50,935	‡$38,516
1 " "	'16	198,635	*118,243	80,392	51,637	‡39,067
12 " "	'17	2,604,278	*1,676,655	927,623	625.685	‡451,906
12 " "	'16	2,256,081	*1,328,133	927,948	645,725	‡421,133
PHILADELPHIA & WESTERN RAILWAY, UPPER DARBY, PA.						
1m., Apr.,	'17	$45,645	$22,683	$22,962	$12,517	$10,444
1 " "	'16	42,802	20,156	22,646	12,525	10,121
12 " "	'17	529,604	256,999	272,605	150,479	122,126
12 " "	'16	481,668	230,790	250,878	148,480	102,398
PHILADELPHIA (PA.) RAPID TRANSIT COMPANY						
1m., Apr.,	'17	$2,456,300	$1,382,948	$1,073,352	$813.746	$259,606
1 " "	'16	2,272,272	1,244,460	1,027,812	816,043	211,769
10 " "	'17	23,457,395	13,162,272	10,295,122	8,142,214	2,152,908
10 " "	'16	21,135,004	11,810,169	9,324,835	8,161,907	1,162,928
REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO						
1m., Apr.,	'17	$368,029	*$250,176	$117,853	$80,425	‡$47,430
1 " "	'16	327,672	*199,281	128,391	67,411	‡63.652
12 " "	'17	4,183,402	*2,565,525	1,617,877	861,749	‡762.344
12 " "	'16	3,445,206	*2,029,746	1,415,460	729,856	‡694,810
TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.						
1m., Apr.,	'17	$839,072	$534,447	$304,625	$145,402	$159,223
1 " "	'16	816,181	506,703	309,478	140,299	169,179
4 " "	'17	3,480,984	2,333,906	1,147,078	580,471	566.607
4 " "	'16	3,307,167	2,115,877	1,191,290	568,181	623,109

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*Includes taxes. †Deficit.

‡Includes addition of miscellaneous income, and deduction of Kansas City surplus reinvested in plant. **During the fiscal year to Feb. 14, 1916, the property was operated by the receivers under the old securities, and the figures for this period, being without value in a comparative statement, are not shown here.

Traffic and Transportation

Copper-Zone System to Be Tried

Massachusetts Commission Authorizes Six Months' Trial of Copper-Fare Zones—Company to Issue Commutation Books

In a formal decision issued on May 25 the Massachusetts Public Service Commission authorized the Concord, Maynard & Hudson Street Railway, Maynard, Mass., to establish for a six months' trial a copper-zone system of fares, based upon a charge of 2 cents per mile for the distance actually traveled, with a minimum charge of 6 cents. The hearing on this case was reviewed in the ELECTRIC RAILWAY JOURNAL for May 5, page 846.

The previous fare unit, 6 cents, has been in vogue since February, 1908. Under the new tariff the maximum increase will be from 6 to 12 cents, between Stow Center and Hudson. Under the former arrangement with connecting roads, transfers were interchanged, with a subsequent settlement at the rate of 3 cents each. Under the new arrangement, transfers from other companies at either end of the line will be accepted for a ride in one zone, while transfers to other railways will be issued as before. Books of coupons will be sold at the 2-cent rate, with the usual half-fare provision for school children.

In an exhaustive analysis of the company's financial condition the commission found that the depreciation reserve is wholly inadequate and that additional revenue is justified. Dividends have averaged 2.48 per cent per year since 1910. The gross income for 1916 was $83,080, and operating expenses $56,499. The capitalization on Dec. 31, 1916, was $515,000. The road is controlled by the Massachusetts Consolidated Railways, and the commission found that the management expenses are reasonable. Improved methods of power-plant operation and rolling-stock maintenance were suggested as desirable.

WHY THE INCREASE WAS JUSTIFIED

The commission was of the opinion that the company is entitled to a return of 6 per cent upon the investment represented by its stock and bonds outstanding and by one-half of the floating debt. On this basis the company is entitled to a return of $29,400 per year, which is about $8,620 below the 1916 figures, without allowing for a more adequate provision for depreciation and maintenance. At the hearing the company presented much evidence regarding recent increased costs of operation, laying special emphasis upon the advanced price of coal. In the three months ended March 31 operating revenue decreased $273 while operating expenses increased $3,247 over that period in 1916.

From the evidence it was estimated that the proposed advance in fares will not increase passenger revenue more than 16 per cent, or $12,761. The commission said that if the property is to be maintained in first-class operating condition, with adequate provision for depreciation, a greater increase would be permissible. From the standpoint of net financial results no objection can be made to the new schedule. The new system of charging, as applied to a street railway interurban in character, and operating through a somewhat sparsely settled territory with a fairly uniform density of population, seemed to be reasonable.

As a practical matter, however, the new schedule somewhat disarranges a method of charging which has been in vogue for a long period, and falls with unequal weight upon the patrons of the road. The commission felt that in the interest of the habitual rider the commutation-ticket principle should be utilized, and after conference the company has agreed to issue commutation-ticket books upon the basis of fifty-two rides for a period of one month, which will enable the purchaser to ride between any two designated points, if he uses all the coupons, at a rate equal to 75 per cent of the regular fare, where that fare is more than 6 cents.

Decisions on Free-Ride Law

Supreme Court Upholds Law in New Jersey Case—Indiana Commission Enjoined from Enforcing Order

A case brought by the Public Service Railway, Newark, N. J., against the legality of the New Jersey law enacted in 1915, covering free rides for policemen and firemen on street railway lines, was decided on May 21 by the United States Supreme Court. It was declared that the law is valid and within the exercise of the police powers of the State. This case was heard by the State Supreme Court and the Court of Errors on the company's motion that the law providing for the free transportation of such municipal employees was taking "private property without just compensation." Both of these courts decided that the law could be enforced and they are now sustained by the higher tribunal. The State holds that the free rides for policemen and firemen are part of its plan to insure for the public the greatest operating efficiency. The law provides for the free transportation of policemen and firemen while on duty, as well as plain-clothes men.

In the matter of the suit filed by the Indianapolis Traction & Terminal Company against the Public Service Commission of Indiana to enjoin the commission from enforcing an order providing for free transportation to city firemen and policemen, three federal judges in the District Court at Indianapolis issued a temporary injunction against the commission on May 25. W. H. Latta, attorney for the traction company, set forth in his argument that the law passed by the State Legislature during the last session, upon which the order of the commission was based, is unconstitutional and its enforcement would violate the franchise rights of the company. The State, represented by Attorney General Stansbury, in its argument relied principally upon the recent decision of the United States Supreme Court in the New Jersey case. The filing of the application for this injunction was reported in the issue of the ELECTRIC RAILWAY JOURNAL for May 26, page 979.

The court at Indianapolis, composed of Judges Francis E. Baker and Samuel Alschuler of the Circuit Court of Appeals, Chicago, and Judge Arthur B. Anderson of the Indiana District Court, did not pass on the constitutionality of the Indiana law, but based its decision in issuing the injunction on the question of the violation of the company's franchise contract with the city. The order of the court does not prevent the enforcement of the "free-ride" order in other cities of the State.

Ten-Cent Fare Proposed

The Danbury & Bethel Street Railway, Danbury, Conn., has announced that, owing entirely to increased operating costs, it has become necessary for it to double the present 5-cent fare for a ride from Danbury to Bethel and to Lake Kenosia. Strips of tickets will be sold at the rate of five tickets for 35 cents. These, however, will not be honored during the week of the Danbury Fair. John Sanders, president and general manager of the company, issued a comprehensive statement when the increase was announced, a part of which follows:

"The company regrets very much that it is compelled to raise its rates. This increase has been under consideration for some time, but has never been put into effect, in the hope that conditions both locally and nationally would improve. However, instead, the cost of operating has steadily increased by reason of the great advance in the price of coal, materials and labor. Coal has advanced in price from 100 to 125 per cent, and is of a quality so inferior that it is at times almost impossible to keep up steam in the power plant. Assuming that the quality of the coal is 50 per cent of what it was formerly, the operating expense for coal alone has increased 200 per cent."

Mr. Sanders enumerated the several other materials of similar high price which are used in the electric railway business, and added: "We trust that the public will realize the reasonableness of the step the company has decided upon, which was made necessary by prevailing conditions throughout the country."

Changes Proposed for Buffalo

Traffic Committee Recommends Trial of Skip-Stop Service and Other Plans to Reduce Congestion and Accidents

In a preliminary report submitted to Mayor Fuhrmann of Buffalo by the special traffic committee appointed some time ago to investigate traffic conditions in that city, the skip-stop system has been recommended for trial on Elmwood Avenue and Main Street. The committee conferred with authorities of the International Railway and found them willing to make a trial of this or any other proposition that would tend to relieve the congested condition. It was suggested that a plan be followed similar to that in other cities and that a vote be taken to ascertain the opinion of the patrons on the two lines regarding the proposed change.

The report recommended also that the railway company be requested to lay an additional track in Shelton Square to facilitate the handling of more cars there, that the island be increased in size and a shelter be erected over it. A single-track connection between Broadway and Clinton Street and other rerouting plans to reduce the traffic congestion on Washington Street south of Broadway were also recommended. In order to insure greater safety to pedestrians, it was suggested that crossing places be marked on the highways and that midway crossings be designated for long blocks.

The committee also made some suggestions pertaining to automobile traffic. It was proposed that trucks should not be allowed to carry loads projecting ahead of the front wheels, that siren whistles should be prohibited on all except vehicles used by the fire department, the police, the sheriff and authorized public utility vehicles for emergency calls, that parking privileges be denied on certain streets and that all approaches to schoolhouses, playgrounds, hospitals and firehouses be plainly marked.

California Jitneys Ask Increase

The first jitney case brought before the Railroad Commission of California under the legislative act passed recently which places the jitneys of that State under the control of the commission was heard in Los Angeles on May 25. The hearing was on an application filed by the White Bus Line, the Crown Stage Line and the Valley Stage Line which asked for authority to raise passenger rates from Los Angeles to Anaheim, Santa Ana and intermediate points. The companies say they are losing money on the present rates, which were filed with the commission when the new legislative act was passed, and which include single and round-trip fares and ten-ride commutation ticket books.

More than 500 jitney companies have filed rates with the commission to date. This is not an indication of the number of automobiles engaged in such traffic, however, because in many cases a single tariff was filed for an association of 100 or more jitney men. It is estimated that about 1000 lines are under the commission's jurisdiction, in which the proportion of passenger lines to freight lines is about eight to one.

Portland Wants Jitney Regulation

Two measures affecting jitney regulation will be on the ballot at the municipal election in Portland, Ore., June 4. One requires the jitneys to furnish a $2,500 bond for protection of passengers and pedestrians, and the other, proposed by the jitneys, eliminates all regulation and turns the streets over for free and indiscriminate use for commercial purposes. As the jitney situation stands in Portland now, there not only is no bond required, but there is virtually no regulation. The jitney men pay a license fee of $2 a month.

In the 161 jitney accidents in Portland in the last two and a half years, three persons have been killed and 191 injured. The injuries have ranged from minor cuts and bruises to permanent injuries, including broken limbs and fractured skulls. In many cases the accidents have been to people financially unable to pay doctors' bill or to lose time from work. There is no record of anyone ever having collected damages from jitney owners on account of accidents, as the drivers in general are financially irresponsible. It was largely on account of these conditions that the Progressive Business Men's Club initiated the measure to be voted on to require jitneys to furnish bonds.

Further Hearing on Closed Vestibules

On May 29 a hearing was held by the Public Service Commission of New York, First District, in connection with a provisional order requiring all surface cars operating in Greater New York to be equipped with vestibule doors, control-interlocks and folding steps by Oct. 1, 1918. The proposed order was opposed by the Second Avenue Railway on the grounds that its closed cars were already equipped with folding doors and that, of the few boarding and alighting accidents occurring on the company's closed cars, none was traceable to the existence of the fixed steps, while the value of the control-interlock appeared to be doubtful. With regard to open cars, the expense of conversion would be prohibitive, approximating $2,400 per car.

W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company, suggested that the order be held in abeyance because of the abnormal conditions now existing, labor and material for the work of conversion being practically impossible to obtain. He estimated the cost of conversion for closed cars at about $650 per car with $50 more if a bigger signal system were installed. It was a physical impossibility to equip all cars by the date mentioned in the order, not only because of shop conditions but also because of the need for protecting the service. E. A. Maher, Jr., vice-president Third Avenue Railway, opposes the extension of the order to cover all of his company's cars. Those cars on Manhattan Island are all equipped with inclosed vestibules, but the older cars and open cars on the outlying lines could be remodeled only at a prohibitive expense.

All of the witnesses testified that in buying new cars, vestibule doors with control interlock and folding steps, as outlined in the proposed order, might properly be specified. Opinion was also unanimous that open cars were not likely to be purchased on any future orders for city equipment, notwithstanding their popularity with the public and their increased earning capacity.

Trolley Car License Fee Doubled.—The City Commissioners have voted to increase the license fee of trolley cars in Atlantic City, N. J., from $50 to $100 each. An ordinance to that effect has been passed and will soon be made effective.

Roads Contract for Picnic Crowds.—The Louisville & Southern Indiana Traction Company, New Albany, Ind., and the Louisville & Interurban Railroad, Louisville, Ky., have begun filling dates for the summer picnic season. The Louisville & Southern Indiana controls an important amusement park and, in addition, has fitted up a picnic ground on Silver Hills.

Seven and Eight-Cent Fares Proposed.—The Middlesex & Boston Street Railway, Newtonville, Mass., has filed with the Public Service Commission of that State new rates showing increases from 6 cents to 7 and 8 cents which will be effective on June 25. The sale of strip tickets at the rate of nine for 50 cents will be discontinued. Fares for school children are set at one-half the new rate on the respective lines.

Hearing on Grade Crossing Order.—A hearing will be held on June 6 by the Public Service Commission for the First District of New York on a motion of Commissioner Charles S. Hervey to inquire whether an order shall not be issued to all steam railroads operating within the city of New York, and having grade crossings protected by crossing gates, directing them to keep the gates lowered from midnight to 5 a. m., except when raised to permit the passage of automobiles and other vehicles. It is believed that such an order would tend greatly to prevent grade crossing casualties inasmuch as all vehicles would be brought to a full stop.

Higher Fares Asked in Easton.—The Northampton, Easton & Washington Traction Company, Easton, Pa., operating between Phillipsburg and Port Murray, has applied to the Public Service Commission of Pennsylvania for permission to increase its rates from 35 cents to 42 cents for a single trip. The hearing on the proposed increase will be held at the State House on June 4. The company proposes to increase the rate by adding 1 cent to the fare in each of the seven zones in which the present rate is 5 cents. The distance in each zone varies from a little less than 1½ miles to nearly 4 miles, making the seven zones cover a distance of more than 17 miles.

Decision on Louisville Grade Crossing Accident.—Criminal court proceedings growing out of the grade crossing disaster in Louisville, Ky., on Feb. 12, which was reported in the ELECTRIC RAILWAY JOURNAL for Feb. 24, page 367, have come to an end. A plea of guilty to the charge of involuntary manslaughter was entered in the Criminal Court at Louisville by H. T. Jeffries, engineer on the Southern Railway train which struck the Broadway street car, this resulting in the death of four persons and the injury of more than thirty. An indictment charged Jeffries with driving his engine recklessly and without a headlight. The prosecuting attorney stated that two important witnesses were out of the jurisdiction of the court and could not be reached. He recommended that the defendant's plea be accepted.

Officials Confer in Duluth Fare Case.—The controversy involving the Duluth (Minn.) Street Railway and the city of Duluth was discussed at a conference of representatives of both sides on May 16. President A. M. Robertson of Minneapolis stated that the company would build the extension to New Duluth if assurance could be had that agitation against the present 10-cent fare to Morgan Park would be discontinued. The rails for the new extension had been ordered for delivery this year and all preparations were made on the basis of the double fare on the line to be extended. Since that time a test suit has been brought to prove the company's right to charge the double fare, as reported in this paper for May 26, page 981. In case the company receives a favorable decision in this suit before Oct. 1, it promises to have the new line in operation before the end of the year. The city commissioners declined to pledge the city to any definite action pending this decision, but it is understood that the city will prosecute the fight for the single fare.

Near-Side Stops Opposed.—An ordinance providing for near-side stops for all cars of the Colorado Springs & Interurban Railway, Colorado Springs, Col., has been passed by the City Council and was to come up for final passage on June 1. There was no opposition to the passing of the ordinance but it was the belief of officials of the company that the public, when fully informed on the subject, would make opposition. Although the company did not oppose the passage of the ordinance officially, it proposed to conduct a campaign to show inconveniences of the near-side stop system. Placards, giving reasons why the proposed change would result in unsatisfactory service, were prepared to be displayed in all the cars. An official of the company is reported to have said: "The company does not contemplate making any changes with its cars, as the near-side stop will not interfere with operation. We can stop on either side of the street, with the patrons entering the cars from the rear entrance, but considerable inconvenience will result to the patrons of the company."

Motormen to Get Bonuses for Saving Power.—The Connecticut Company has announced a plan whereby motormen on its lines in New Haven will receive cash prizes for the best power-saving record. The men are requested to cooperate in the scheme, which is intended to promote economy during the war. The announcement read, in part, as follows: "The company will award quarterly cash prizes of $3 to $10 to the motorman whose record for saving power indicates he has used the best judgment in running his car. To determine which motormen are the most efficient the cars have been equipped with power-saving recorders. Twice a month a statement will be posted in the different carhouses showing the standing of each man for the preceding two weeks. Only men on the same run or under the same conditions will be compared and all comparisons will be made on a per mile basis. Make the stops as short as possible but have regard for the safety and convenience of the public. Economy must begin only when safety has been assured. When necessary, assist the passengers in and out of cars. This is a good policy and will save time and power."

Legal Notes

FEDERAL COURT.—*Right to Use Highway Bridge—Compensation.*

Any legal right of a street railway company to use highway bridges without the county's consent and without making compensation was destroyed by the execution of a formal contract between the county commissioners and the street railway company in order to settle the controversy between them as to their respective rights in the matter, whereby the county granted, subject at all times to revocation, the right to use the bridges in consideration of the street railway company's promise to pay a specific sum per annum for the use of each bridge.

To require such a company, under such a grant, to pay one-third of the actual cost of removing the old bridges and erecting new ones before such company should be permitted to use the new structures, was within the power of the county authorities, under Ga. Laws 1914, p. 487, providing that all existing permits and franchises to operate over any of said bridges are revoked and repealed "so far as the same applies to any future bridges hereafter constructed under this or any other law," unless the street railway company will conform to the reasonable terms and conditions prescribed by the county authorities, giving the latter exclusive right and jurisdiction to grant franchise to operate over new bridges, and to prescribe terms for such grants, and empowering them to require, as a condition precedent, that any grantee shall pay to the county "one-third of the actual cost of the building of said bridges . . . but any corporation now having a franchise shall have the right to use any new bridge upon complying with reasonable conditions imposed" by the county authorities and the terms of the act. (Rome Railway & Light Co. v. Floyd County, 37 Supreme Court Rep., 291.)

NEW YORK.—*Penalty for Defective Transfer Enforceable Even When Defect Was Due to Carelessness.*

Under public service commission law (Consol. Laws, chap. 48) sec. 49, subd. 7, requiring street railway companies to carry any passenger desiring to make a continuous trip between two points for a single fare, to give him a transfer entitling him to such trip, and providing a penalty of $50 for refusal, where a passenger paid his full fare but received a transfer not punched so as to entitle him to ride in the car to which he transferred, so that he was required to pay another fare, the company was liable for the penalty, though the refusal to comply with the statute was the result of carelessness or inadvertence of its employees to carry out instructions. (Osborne v. International Railway, 164 New York, Sup., 226.)

NEW YORK.—*Mandamus of Commission Requiring Company to Build Road Denied by Court—"Duty Compelled by Mandamus Must Be Plain and Unmistakable."*

An electric light company acquired the property and franchises of a street railroad, and the Public Service Commission applied, under public service commissions law, Sec. 57, for mandamus to compel it to construct and operate a street railroad on certain additional roads and between certain additional points. The original railroad company's franchise from a town to operate on the road in question had been forfeited for non-user by the express terms of the franchise and the provisions of the railroad law. It was doubtful whether any legal obligation rested on the defendant to operate any road beyond that already constructed and operated at the time of its purchase of the street railroad in 1902. There was no proof that the city or the property owners had given their consent, or would give it, to the new railroad construction and operation. *Held*, that the Public Service Commission's application for mandamus would be denied, since the operation and duty compelled by mandamus must be plain and unmistakable and not subject to doubt. (Public Service Commission for First District v. Richmond Light & Railroad Co., 163 New York Sup., 64.)

Personal Mention

E. C. Howard has been appointed traveling freight agent of the Toledo & Western Railroad, Toledo, Ohio, to succeed W. J. Chisholm.

W. J. Chisholm has been promoted to the position of traffic manager of the Toledo & Western Railroad, Toledo, Ohio, effective June 1, to succeed A. C. Wegner, who resigned.

F. P. Gutelius has been elected vice-president of the Delaware & Hudson Company, in charge of the operating and traffic departments, with headquarters in Albany, N. Y., to succeed C. S. Sims.

F. W. Smith, who has been general storekeeper to the Ogden, Logan & Idaho Railway, Ogden, Utah, has resigned to accept a position with the Phoenix Construction Company, with headquarters at Ogden.

Henry L. Doherty was the guest at an anniversary dinner recently, the occasion being his forty-seventh birthday. The tribute to Mr. Doherty was attended by 117 members of the Doherty organization. Frank W. Frueauff presided.

John F. Wessel was recently elected a vice-president of the United Gas & Electric Engineering Corporation in charge of the Northern properties succeeding S. J. Dill, who will devote his time to the oil interests of the corporation.

L. J. Hirt, formerly vice-president of the Pearson Engineering Corporation, has been appointed consulting engineer for the United Gas & Electric Engineering Corporation and will supervise the construction and engineering work of the subsidiary companies.

H. C. Berry, heretofore superintendent of the Salem district for the Electric Company of New Jersey, will enter high-tension construction work for the American Railways, Philadelphia, Pa. L. Scott Schilling has been appointed to succeed Mr. Berry at Salem.

L. J. Miller, formerly roadmaster and superintendent of substations of the Chicago, South Bend & Northern Indiana Railway, with headquarters at South Bend, has resigned to accept a similar position with the Boston & Worcester Street Railway, with headquarters at Framingham, Mass.

A. B. Paterson, formerly manager of the Meridian Light & Railway Company, Meridian, Miss., operated by H. L. Doherty & Company, who resigned to become bond department representative of the Doherty organization at New Orleans, was the guest of honor at a farewell banquet given recently in Meridian.

F. P. Will has resigned as superintendent of the Burlingame (Cal.) Electric Railway to accept a position as general agent and warehouse foreman of the Modesto & Empire Traction Company, Modesto, Cal., effective June 1. Mr. Will has been superintendent of the former road since 1913, when it was built.

Charles Brown, who for several years was superintendent of the Dover-New Philadelphia and the Dover-Uhrichsville divisions of the Northern Ohio Traction & Light Company, Akron, Ohio, has been promoted to superintendent of the Akron City and Akron-Barberton-Wadsworth divisions. He has been succeeded by Roy Kennedy, formerly a conductor on the Tuscarawas Traction division.

George H. Storms, who for many years has been associated with the Fort Smith Light & Traction Company, Fort Smith, Ark., has been promoted to the position of auditor for the Ottumwa Railway & Light Company, Ottumwa, Iowa. Both companies are operated by H. M. Byllesby & Company, Chicago.

C. Nesbitt Duffy, vice-president of the Manila Electric Railroad & Light Company, Manila, P. I., who recently returned to the islands from the United States, has been elected president of the Friendly Sons of St. Patrick. He also had the honor of presiding at a dinner tendered some weeks ago to the visiting "American Honorary Commercial Commission."

Stephen E. Dillon, who was elected president of the Arkansas Association of Public Utility Operators at its annual convention, held on May 16-18, has been general manager of the Public Utilities of Hot Springs, Ark., since October, 1911. The water, gas, electric light and street railway properties are under his management. Previous to that time Mr. Dillon had twenty-nine years of service with steam railroads. He entered the service of the Burlington system as a messenger boy in 1881.

C. S. Sims, vice-president of the Delaware & Hudson Company, at Albany, N. Y., has been transferred to Montreal, Quebec, as resident vice-president. Mr. Sims is also vice-president of the United Traction Company, Albany, N. Y., the Cohoes (N. Y.) Railway, the Hudson Valley Railway, Glens Falls, N. Y., and the Troy & New England Railway, Troy, N. Y, all controlled by the Delaware & Hudson Company and of the Schenectady (N. Y.) Railway and the Plattsburgh (N. Y.) Traction Company.

E. J. Blair, electrical engineer of the Chicago (Ill.) Elevated Railways, who was recently commissioned captain in the Engineers' Reserve Corps, has gone into training at Fort Sheridan. Mr. Blair has been with the elevated companies since his graduation from Cornell University in 1905. Before the consolidation of these companies in 1911 he was employed in various capacities by the Metropolitan West Side Elevated Railway, for the last two years of its separate existence as electrical engineer. Mr. Blair is active in the American Electric Railway Engineering Association, and is president of the local section of the American Association this year.

Charles J. Laney, heretofore traffic manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, has resigned to accept a similar position with the Northern Ohio Traction & Light Company, Akron, Ohio, effective June 11. Mr. Laney was formerly employed in the freight department of the Toledo & Ohio Central Railway and of the Wabash Railroad. In 1907 he became connected with the Toledo Urban & Interurban Railway, and later with its succcessor, the Toledo, Bowling Green & Southern Traction Company. He served this road for two and one-half years as assistant general freight agent, and in 1909 was appointed traffic manager to succeed H. H. Stephenson. Mr. Laney had been traffic manager of the Cleveland, Southwestern & Columbus Railway since March, 1913.

Waldo G. Paine, vice-president and traffic manager of the Spokane & Inland Empire Railroad, Spokane, Wash., has been appointed assistant general freight and passenger agent of the Spokane, Portland & Seattle Railway, in addition to his other duties. Mr. Paine is a native of Minnesota, but has been identified with interests in Spokane since 1889. After a period in the real estate business, and a subsequent connection with a mercantile company, he became one of the incorporators of the Coeur d'Alene & Spokane Railway. This company, with others, was later consolidated as the Spokane & Inland Empire Railroad, and Mr. Paine was made general freight and passenger agent. He was appointed vice-president and traffic manager in 1910, following a reorganization of the company. In his position with the Spokane, Portland & Seattle Railway he succeeds A. B. Jackson, formerly general agent for that road and the Chicago, Burlington & Quincy in Spokane, who remains freight agent for the latter road, while Mr. Paine will handle the passenger business.

Obituary

J. C. Woodsome, local manager of the Tampa (Fla.) Electric Company, died recently at his home in Tampa at the age of forty years. Mr. Woodsome was born in Boston, Mass. He was graduated from the Massachusetts Institute of Technology in 1901 and during the year following was an assistant instructor in that institution. For the next four years he was employed in the office of the Stone & Webster Management Association and was connected with that organization until his death. In 1906 he was appointed superintendent of the Houghton County Electric Light Company, Houghton, Mich., and the same year was transferred to the Dallas Electric Light & Power Company, Dallas, Tex., as general superintendent. Mr. Woodsome had been manager of the Tampa Electric Company since 1911.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Fiscal Agency Company, Jackson, Miss.**—Incorporated to purchase and control public utilities. Capital stock, $15,000. Incorporators: C. E. Moritz, W. A. S. Wheeler and W. D. Mounger, all of Natchez.

***Lehigh Valley Realty Company, Allentown, Pa.**—Chartered by officials of the Lehigh Valley Transit Company to take over and operate the various subsidiaries, consolidating under one head for more efficient control. The company will handle the realty interests of the company, with power to acquire lands for extensions and rights-of-way. H. R. Fehr, Allentown, president.

FRANCHISES

Hollywood, Cal.—The Pacific Electric Railway has asked the City Council for permission to substitute a single-track line on Franklin Avenue for the portion of the line which is now double-track.

Visalia, Cal.—The Visalia Electric Railroad has received permission from the Railroad Commission of California to construct its tracks at grade across three public highways in Tulare County.

Hartford, Conn.—The Connecticut Company has asked the Public Utilities Commission of Connecticut for its approval of the proposed method of reconstruction of its lines on Main Street between Church and Village Streets, Huyshope Avenue, Albany and Blue Hills Avenues and Windsor Avenue and the construction of a connecting curve on State and Market streets.

Lawrence, Kan.—The Kansas City, Kaw Valley & Western Railway has asked the City Council of Lawrence for a new franchise, the same in effect as that passed by the Council last summer and which the company failed to accept. The ordinance as proposed gives the company the right to operate its cars along the present routes and also to construct an extension east on Levee Street to New York Street.

Lawrence, Kan.—The City Council of Lawrence has passed an ordinance granting the Kansas City Railways permission to construct an extension from Eighteenth Street to Twenty-ninth Street.

***Kansas City, Mo.**—The Clinton Construction Company has asked the County Court for permission to construct an electric railway crossing any county road from the eastern end of Thirty-first Street to Leeds and thence to Blue Ridge Boulevard. Willard E. Winner, president.

Buffalo, N. Y.—The Public Service Commission for the Second District of New York has approved the construction of an extension by the International Railway on Elmwood Avenue from Hertel Avenue to the north city line.

Westerville, Ohio.—A franchise prepared by the Columbus Railway, Power & Light Company has been rejected by the Franklin County commissioners, who objected to the scale of fares proposed and the provision for the appointment of a commissioner to look after the county's interest for ten years and then give way to a company official after that time. The commissioners now propose to prepare a franchise which will provide for the creation of three zones with a fare of 5 cents each. Under this franchise the company will be required to pay a portion of the cost of any road or bridge improvement work.

Tacoma, Wash.—The Puget Sound Traction, Light & Power Company has received a fifty-year franchise from the Council to maintain a transmission line along certain public highways in Pierce County.

TRACK AND ROADWAY

Little Rock Railway & Electric Company, Little Rock, Ark.—A communication from the Little Rock Railway & Electric Company states that the proposed extension on Pike Avenue from Eighth to Eighteenth Street will be built by the Inter-City Terminal Railway and not by the Little Rock Railway & Electric Company, as stated in the ELECTRIC RAILWAY JOURNAL for May 19.

Visalia Electric Railroad, Exeter, Cal.—Plans drawn up by the surveying engineers of the Visalia Electric Railroad for the further extension of its lines through the Porterville district and south of Porterville have been approved and it is expected the actual construction of the line will be carried through without delay.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company has received permission from the Board of Public Works to construct an additional track in Martindale Avenue from the tracks of the Indianapolis Union Railway Company to Twenty-fifth Street, to facilitate the handling of troops to Fort Benjamin Harrison.

Kentucky Traction & Terminal Company, Lexington, Ky.—This company is reconstructing its track on Georgetown Street. The company has been required by the city to change its track for a distance of about ¾ mile from the south side to the middle of the street, and the plan is to build an entirely new track in the center of the street and not disturb the old track until it is completed and ready for use. Then the old track will be removed and cars routed over the new link.

***South Newcastle, Me.**—Burgess, Lang & Company, Boston, are promoting the construction of an electric railway from South Newcastle to Boothbay Harbor. The company has acquired a controlling interest in the Portland Power & Development Company at Damariscotta Mills. It is reported that the company may acquire the Wiscasset, Waterville & Farmington Railroad, a narrow-gage steam road.

Worcester (Mass.) Consolidated Street Railway.—This company proposes to construct an extension of its Hamilton Street line down through Lake Park.

Laurel Light & Railway Company, Laurel, Miss.—This company proposes to construct an extension to the Pettibone addition if the city will make certain changes in streets near the plant of the Texas Oil Company. The proposed line would be extended from the present Wausau line at the intersection of Central Avenue and Maple Street, east in Central Avenue to Pine Street, to Meridian Avenue and Joe Wheeler Avenue, ending at the northeastern city limit.

Trenton, Lakewood & Seacoast Railway, Trenton, N. J.—The right-of-way of the Trenton, Lakewood & Seacoast Railway in Lakewood township will be sold at a foreclosure sale to satisfy three judgments, two in the Supreme Court and one in the common pleas court. Two of the judgments were obtained against the Trenton, Lakewood & Seacoast Railway and one against the Vandergrift Engineering Company. Wilfred H. Jayne, Lakewood, and Frederick S. Wack, Point Pleasant, are the attorneys. [May 19, '17.]

Brooklyn (N. Y.) Rapid Transit Company.—Operation has been begun by the Brooklyn Rapid Transit Company between Crescent and Eleventh Streets on the extension of its elevated line from Cypress Hills to Clifford Avenue, Jamaica. At present it is a two-track line, but it will be enlarged when traffic conditions warrant. It is expected that the entire line to Clifford Avenue will be completed by the end of the year.

International Railway, Buffalo, N. Y.—A movement has been started in North Tonawanda to force the International Railway to elevate its new line through North Tonawanda and not permit it to operate at grade from Payne Avenue through Gratwick.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded a contract to J. H. Burton, Jr., & Company, Inc., New York, at $54,913 for supplying order No. 4, consisting of untreated ties and timber for use on new rapid-transit railroads. The commission has declared forfeited the contract made with it by the Flick & Manuell Construction Company, New York, for the construction of the elevated portion of the Pelham Bay Park branch of the Lexington Avenue subway. This action was taken on May 23, upon which day Governor Whitman signed the Lockwood bill giving the commission the power to take over and complete with its own forces any rapid-transit construction contract which the contractor is unable for any reason to prosecute satisfactorily. A report has been made to the commission that all work had ceased on the Flick & Manuell contract and that the company was unable financially to carry the contract further. The commission, now being in possession of the work, has appointed Joseph H. Flick as manager for the city to push the work to completion.

New York State Railways, Syracuse, N. Y.—Work has been begun by the New York State Railways double-tracking its line on Euclid Avenue. The company is also replacing the brick pavement along its tracks in North Salina Street from Butternut to Catawba Street with groove-cut stone blocks. The two improvement jobs involve an expenditure of about $62,000.

Ohio Traction Company, Cincinnati, Ohio.—The city officials of Wyoming have asked the Ohio Traction Company to construct new track in Wyoming to cost about $60,000.

Port Colborne, Ont.—The Niagara District Hydro-radial Association has forwarded a resolution to the Provincial Government, asking that body to permit the construction of the proposed trolley line from Port Colborne to Bridgeburg and from Dunnville to Port Colborne immediately, instead of waiting until after the war.

Southern Pacific Company, Portland, Ore.—Announcement has been made by J. H. Dyer, assistant general manager of the Southern Pacific Company, that electrification of the company's line from Whiteson to Corvallis, 30 miles, will be completed between June 15 and July 1.

Southern Pennsylvania Traction Company, Chester, Pa.—This company plans to double-track its Chester-Darby line on Chester Pike.

Gettysburg (Pa.) Railway.—The rights-of-way of the Gettysburg Railway to Battlefield Park have been sold to the United States, appropriation for which was included in the Army bill recently passed. It is expected that the wire and rails of the company will be for sale shortly, and any inquiries along that line should be addressed to C. Taylor Leland, 414 Harrison Building, Philadelphia, Pa.

Hershey (Pa.) Transit Company.—This company reports that it is completing surveys for its proposed extension from Hershey to Manheim, but construction work on the line will not be begun for the present.

Columbia Railway, Gas & Electric Company, Columbia, S. C.—This company plans to construct an extension between 5 and 10 miles long to the prospective United States Army camp east of the city.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—Work has been begun by this company on the construction of an extension from Rossville to Chickamauga Park. It is expected that the line will be in operation by June 15.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—This company will construct a new station at West Chapman and Lemon Streets, Orange.

Chicago & Joliet Electric Railway, Joliet, Ill.—The directors of the Chicago & Joliet Electric Railway have authorized the erection of a new office building, at a cost of $35,000, to replace the structure destroyed by fire in January.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded a contract for the construction of station finish for nine stations on the Eastern Parkway subway and the so-called Brighton Beach connection in Brooklyn to Snare & Triest Company, New York, at $464,540.

Piedmont & Northern Railway, Charlotte, N. C.—Fire recently destroyed the freight station of the Piedmont & Northern Railway at Greenville, S. C., causing a loss of about $4,000.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—It is reported that final details are being arranged by the Trenton & Mercer County Traction Corporation for the erection of its proposed new station at University Place and Dickinson Street, Princeton.

Valley Railways Company, Lemoyne, Pa.—Preliminary plans have been prepared by the Valley Railways for the construction of a terminal station at Walnut and River Streets, Harrisburg, in connection with the double-tracking of its line on Walnut Street, connecting with the Harrisburg Railways system. The proposed plans are being considered at a series of conferences with the City Council and City Planning Commission.

West Chester (Pa.) Street Railway.—Increased terminal facilities for West Philadelphia and a station almost twice the size of the present Sixty-ninth Street terminal are projected by the West Chester Street Railway and the Philadelphia Rapid Transit Company. A new station that will handle twice the number of people, eight tracks for the West Chester Street Railway in place of the five now in use, expansion and extension of the Philadelphia Rapid Transit terminus and moving the West Chester turnpike 60 ft. to the south are some of the improvements contemplated to handle the increasing growth of traffic at the point where Delaware County adjoins the city.

POWER HOUSES AND SUBSTATIONS

Union Traction Company of Indiana, Anderson, Ind.—A substation power plant has been moved from this company's power house at Anderson to Fort Benjamin Harrison, near Indianapolis. The station will be set on a siding and will handle power to be used in hauling the large crowds going to and from the fort.

Centerville Light & Traction Company, Centerville, Iowa.—This company has purchased a number of small central station companies in the vicinity of Centerville and expects to erect 13,200-volt transmission lines to connect these plants with its power station.

Tri-City Railway & Light Company, Davenport, Iowa.—Improvements involving an expenditure of about $400,000 to its local system are contemplated by the Tri-City Railway & Light Company. The work will include the installation of a 20,000-kw. turbine, rebuilding of electric transmission lines, installation of new equipment, etc. Energy will be transmitted from the power station at 13,200 volts instead of 4800 volts, as at present, when the improvements are completed.

Manhattan City & Interurban Railway, Manhattan, Kan.—This company is in the market for 200-kw. rotary converters.

McComb & Magnolia Light & Railway Company, McComb, Miss.—This company, which is constructing a line between Summit, McComb, Fernwood and Magnolia, will erect a power-plant at Fernwood. S. M. Jones, Laurel, president. [April 29, '16.]

Pittsburgh, Harmony, Butler & Newcastle Railway, Pittsburgh, Pa.—This company has awarded a contract to the Faber Engineering & Construction Company of Pittsburgh for the construction of a new storage dam and addition to its power plant at Harmony Junction.

Montreal (Que.) Tramways.—A contract has been placed by the Montreal Tramways with the Canadian General Electric Company for a 12,500-kw. steam turbo-generator, to be installed in the new power station at Hochelaga. The proposed improvements include a new substation, additional equipment and a conduit system linking up the various plants.

West Virginia Traction & Electric Company, Morgantown, W. Va.—Four Taylor stokers have been ordered by the West Virginia Traction & Electric Company for its power house at Morgantown to take care of the increased load. Two of these stokers will be installed under the new 500-hp. boilers now being erected and two will be installed under the present gas-fired boilers.

Wisconsin Electric Railway, Oshkosh, Wis.—It is reported that the Wisconsin Electric Railway contemplates the erection of a power plant.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Market Quotations Business Announcements

Reducing the Selling Cost

Pointed Suggestions to Long-Winded Salesmen—Costs Increased by Uncertainty as to Who Really Buys

By W. McK. White
Holden & White, Inc., Chicago, Ill.

Much interest attaches to the discussions in the Manufacturers and Markets department of the Electric Railway Journal with reference to the possibilities of reducing the selling cost and thereby benefiting the purchasers. But it appears to me that the purchasing department of a railway is not totally responsible for the high selling costs and that to a marked degree both the executive and technical departments share the responsibility.

As Mr. Johnston intimates in his article published on page 899 of the May 12 issue, the law of averages prevails, but it is only through the reduction of one individual cost after another in the selling system that the general average will ultimately be reduced.

These Factors Raise the Cost

There are a number of poignant causes that contribute to the high sales cost of electric railway commodities. Consider, for example, the cost induced by the long-winded salesmen, or the purchasing agent who permits a salesman to assume that the purchasing department has final decision on a definite deal, when the purchasing agent really should refer the salesman to another department head. Consider also the prevalence of curiosity testers and the inability of some mechanical or electrical departments to "sell" articles to their own executives. But perhaps of greatest importance is the case of executives who could easily reduce the time consumed by manufacturers' representatives in concluding negotiations for the equipment under consideration.

There have been many instances in which the railway men apparently do not realize the vast amout of time and money spent by manufacturers in studying railway conditions and in perfecting apparatus to reduce operating and maintenance costs. While, of course, the success of any particular device of this kind is profitable to the manufacturer, yet it is practically a "fifty-fifty" matter, because the success of a labor or material saving device, or of an article which reduces maintenance or operating costs, is of direct benefit to the railway. Therefore the close co-operation of the railway men and the supply manufacturers is one of the first means of reducing the railway cost of materials.

Peddlers and Salesmen

For this reason we believe that the term "peddler" is a misnomer and is not always used with a sense of approval on the part of railways. As a matter of fact, it is the so-called "peddler" who is frequently the man responsible for decreasing some railway expense, and if this is the case he should be given consideration. One can point to many electric railways where the high-class supply man is welcomed, or is made to feel welcome, and it is these roads which obtain the first benefits of new articles which reduce operating costs.

The long-winded salesman was mentioned. This is the man who will take up office hours "getting acquainted" and in talking on subjects entirely foreign to the immediate business, when it is apparent that the railway man has other things to do. We do not deprecate the idea of making friends wherever possible, but we do feel that when there are other salesmen waiting for interviews, or when a railway man has some problem under study, that is not the moment to consume either his time or ours. This cannot be emphasized too emphatically.

Time Wasted Costs Money

There are frequent cases on record where representatives of manufacturers have been invited to railway properties to negotiate on some specific proposition, but when they arrived they found that the man who made the appointment could not keep it. If the railway man invites a salesman to call, he certainly should notify that salesman of any change in his plans, even if this entails telegraphing. In one case a superintendent of motive power invited salesmen from three distant cities to meet him in a Central Western point on a certain day two weeks later. On that day the sales representatives were at the appointed place, but the railway man left word with one of his associates expressing his regret at not being able to see them as he had to leave town that morning.

A recent similar case is one where a master mechanic took a salesman to the general manager's office to decide finally on a sales proposition. The general manager said to the master mechanic: "Charlie, I am too tired to think of that to-night; come around to-morrow." The salesman had to stay over night. On the next day the general manager asked, "Is this device the one you want?" The master mechanic said, "Yes." Then the manager said: "All right; go ahead and put through a requisition." Now, this is another case where a day's extra expense was added to the sales costs. These are two actual examples, and practically every sales representative can cite similar cases. The lesson to be learned is an important one.

The last statement is partially connected with the former—that some technical men on railways either do not have the courage of their convictions or are unable to convince the executive departments of the possible saving or the possible increased efficiency to be gained by the use of some commodity. This is an every-day occurrence. It is realized that mechanical or electrical departments frequently want equipment expenditure for which the company finances do not justify; but there are also instances where equipment is vitally necessary, where the reduction in maintenance cost warrants the expense and where the company resources make its purchase entirely feasible, but where the department head is afraid of criticism if he places an order for the equipment.

Curiosity Testing

Another habit which increases selling cost is that of curiosity testing. Practically every manufacturer is sending out equipment for inspection or trial installation, and a definite percentage of this goes to railway men who are accustomed to place such orders just to see what a device may be like and with full knowledge that they are under executive orders not to buy anything. At the same time it is known that there are salesmen so insistent on the forwarding of a piece of apparatus that the only way a department head can settle the matter is by having the apparatus come forward. In such instances, if the mechanical or electrical man knows that he cannot purchase, it would be far better to "decline with thanks" such an offer.

Finally (this suggestion is made in all seriousness), if the technical departments, as well as the purchasing and executive officials, would follow closely the advertisements in the electric railway trade journals and then would actually answer the advertisements, they could be more fully conversant with new apparatus at a less traveling and time cost to the manufacturer. Consequently they would co-operate to reduce selling price.

Signal Repair-Part Stocks

Value of Local Stocks Is Great—Steam Roads Ask Manufacturers to Suggest Lists—Author's Company Orders Reserve Parts with Manufacturing Requirements

By F. K. Davis

General Manager Hoeschen Manufacturing Company, Omaha, Neb.

A railroad which either through necessity or wisdom decides to install automatic signals or highway-crossing bells, should realize that the failure of a certain part is very costly when all the facts are taken into account. If the necessary repair part must be ordered, a telegram usually is sent, and even if the manufacturer has the stock on hand, one or two days will elapse before the railroad can receive the much needed part. Also there may be considerable expense involved in making shipment by express.

In a number of places I believe the law requires that when a failure of crossing signal or bell is reported a watchman must be placed on that crossing until the signal is repaired, and if an automatic signal fails, orders must be issued for trainmen to disregard all indications of the signal. Likewise when the signal is again placed in service a new set of orders must be issued. Hence I believe it will be found that the money spent by the railroad in procuring emergency repair parts will more than equal the interest that would be paid if the parts had been purchased and carried in stock.

Steam Roads Co-operate on Lists of Parts

Several years ago, when the General Railway Signal Company completed an installation of alternating-current automatic signals for the Grand Trunk Railroad in the State of Illinois, the railroad requested the manufacturer to make out a list of the parts which would be advisable to have on hand at the signal storehouse nearest the signal installation so that repairs could be made with the least delay possible. This list of material, after being checked by the railroad forces, was ordered and placed in stock. No manufacturer would attempt to crowd in too much on a list of this kind. His pride in his equipment and the prospect of securing future business would act as a sufficient check.

The Grand Trunk Railroad also contracted each year for all the mechanical interlocking appliances required, either for new contracts or for repairs during the term of the contract. It was usually specified that certain parts should be kept in stock by the manufacturer, and that these should be ready for prompt shipment. But during the course of the year, if orders for such a part did not equal the amount specified, arrangements were made to take over into the railroad's stores all or a part of the remainder. I know, however, that each signal supervisor endeavored to the best of his ability to keep on hand at some railroad storehouse in his territory a few of the parts which were most likely to be broken by derailment or other train accident so that repairs could be made without delay.

No Fixed Rules to Follow

No set rule can be laid down by the manufacturer in regard to the matter of stock on hand for repair parts. The manufacturer must give his customer the best service possible, but it is also the manufacturer's privilege to invest his funds to the best advantage.

With certain exceptions we take care of our repair-part and new-equipment orders from the same stock. For instance, we will order enough of a certain part to equip 100 crossing bells and then add to this order enough more to enable us to meet all ordinary requirements for repairs.

Occasionally we receive orders calling for a relatively large number of a certain part, when our stock of that particular part is low. Such an order evidently is required for maintenance stock and no great harm can be done if the order is held for a time until we can fill it. It seems to me that this is the ideal way in which to handle the reserve supply stock. The railroad has to pay interest on the capital invested in keeping such a stock on hand, but the money and time saved by being able to make repairs promptly will go a long way toward offsetting the interest charge which attends having the parts ready for instant use.

37,000,000 Ties Treated in 1915

According to the latest figures compiled by the Government Forest Bureau, 37,085,585 crossties were treated during 1915. This is about 38 per cent of the total number of ties reported purchased during that year. Of the total number of ties treated in 1915, 25.831,204 were hewed ties and 11,254,381 were sawed ties.

There are many different causes of deterioration which necessitate the renewal of ties, the principal ones being decay, mechanical wear, breakage, insect attack, splitting, etc. In recent years the railroads have been prolonging the life of their ties by the use of preservatives, principally zinc chloride and creosote oils. Most of the crossties treated by the steam railroads in the United States are treated in closed cylinders permitting the application of a high pressure and designed to secure a heavy absorption of the preservative.

The schedules furnished to the steam and electric railroads did not request information as to the number of ties treated in 1915, but the Forest Service gathered statistics for this year from all of the treating plants in the United States. The table shows the number of ties treated by the preserving plants during 1915, by kinds of preservatives and kinds of wood.

Number of Crossties Treated by Preserving Plants During 1915, by Kinds of Preservatives and Kinds of Wood

Kind of Wood	Total	Zinc Chloride	Creosote	Zinc chloride and Creosote	Miscellaneous
All kinds	37,085,585	17,819,284	17,077,069	2,182,712	6,250
Oak	16,885,517	7,954,492	7,365,673	1,565,352	....
Southern pine	8,541.203	3,257,565	5,243,516	40,122	....
Douglas fir	3,553,854	2,760,952	787,247	....	5,655
Beech	2,933.737	100,000	2,469.202	364,535	....
Western pine*	2,007,609	1,702,167	301,581	3,861	....
Tamarack†	932,038	449.660	390.017	91,496	865
Gum	277,886	204,653	1,650	71,583	....
Birch	173.971	55	173,916	....	....
Elm	50,846	50.846	....	....	....
Maple	36,942	316	36,626	....	....
All other	1,691,982	1,338,578	307,641	45.763	....

*Includes lodgepole pine and Western yellow pine.
†Includes Western larch.

NEW YORK METAL MARKET PRICES

	May 3	May 31
Prime Lake, cents per lb.	31	32½
Electrolytic, cents per lb.	31	32½
Copper wire base, cents per lb.	36	36
Lead, cents per lb.	9⅞	11⅜
Nickel, cents per lb.	50	50
Spelter, cents per lb.	9½	9⅝
Tin, Straits, cents per lb.	58½	67
Aluminum, 98 to 99 per cent, cents per lb.	60	63

OLD METAL PRICES

	May 3	May 31
Heavy copper, cents per lb.	24½	28
Light copper, cents per lb.	21½	25¼
Red brass, cents per lb.	18½	19½
Yellow brass, cents per lb.	17½	18
Lead, heavy, cents per lb.	7¾	9½
Zinc, cents per lb.	7	7
Steel car axles, Chicago, per net ton	$41.50	$42.50
Iron car wheels, Chicago, per gross ton	$24	$30.50
Steel rail (scrap), Chicago, per gross ton	$31.50	$34.50
Steel rail (relaying), Chicago, per gross ton	$39	$39
Machine shop turnings, Chicago, per net ton	$11.00	$14.50

CURRENT PRICES FOR MATERIALS

	May 3	May 31
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38	$38
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.85	$4.00
Steel bars, Pittsburgh, per 100 lb.	$4.00	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$6.85
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl	$2.12	$2.12
Cement (carload lots), Chicago, per bbl	$2.16	$2.16
Cement (carload lots), Seattle, per bbl	$2.60	$2.50
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.25
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.26
White lead (100 lb. keg), New York, cents per lb.	10¾	11¾
Turpentine (bbl. lots), New York, cents per gal.	52	45

Copper Market Conditions

The copper market situation, as reviewed in *Copper Gossip*, published by the National Conduit & Cable Company, is improving. It says: "There has been substantial activity in the market for copper lately, with an upward trend to prices. The indication at present is that government purchases in future will be at approximately market prices. With this prospect in view the copper situation has become a more normal and legitimate affair. The trade is perfectly satisfied to let the law of supply and demand regulate the market value of copper. If, however, arbitrary action is exercised for the purpose of forcing prices either up or down the effect cannot but be disastrous. Such a method is certain to prove an unsettling factor to business stability. It is important that there should be an absolutely definite understanding regarding this matter, and a reassuring official statement to the effect that the selling price of copper, to all parties, will be governed by the established laws of trade. An artificially low price will create commercial unsettlement as well as a fictitiously high price. They are both destructive to prosperity.

"The copper situation is therefore one of intense interest and concern for the whole civilized world. The metal is needed in unprecedented quantities. It is also calculated to allay any apprehension regarding a possible shortage in supplies to specially note that mine and refining capacity were never so well equipped to meet demand as at present. New copper producing territory has been opened, smelter and refining facilities have been greatly enlarged, and the prospect is for a new record-breaking production. There is consequently not the shade of an excuse for boosting market prices to any previously unattained limit. Such a scheme would justly deserve to prove an ill-fated experiment."

Human Factor in Industry

The Western Efficiency Society held a national conference at Chicago, May 23 to 26, and presented an active program on the human factor in various phases of industrial preparedness. Addresses were made by C. E. Knoeppel, New York; Harrington Emerson, New York; W. A. Grieves, Columbus, Ohio; Magnus Alexander, West Lynn, Mass., and other authorities on industrial progress. At an evening session Charles R. Van Hise, president University of Wisconsin, presented an address on "Government Control of the Industries." One entire session of the convention was devoted to the discussion of labor problems, at which both employers and union labor representatives were heard. The permanent offices of the Western Efficiency Society are at 327 South La Salle Street, Chicago. This organization is composed of business managers, heads of departments, industrial engineers and experts, and others interested in the most effective means of production and distribution.

A Ton of Sapphires

The statement that a ton of sapphires will be used during 1917 by a manufacturer in the electric railway and central station field arouses interest because of the novelty and value of this material. Yet this is the quantity which will be required during 1917 by the Sangamo Electric Company for jewels for thrust and ring bearings in its electric meters. Sapphires for this purpose are purchased in the rough and must be put through a process of finishing and inspection which in thoroughness and accuracy compares with the methods followed in the watch-making industry.

The Sangamo company reports an increase of 50 per cent so far in 1917 as compared with the corresponding months in 1916 in orders for electric meters for central station purposes and "economy meters" for electric railway car energy-saving service. Nearly 1000 employees are now engaged exclusively in the manufacture of meters in a large new plant at Springfield, Ill. The materials required for meter manufacture are just those which have shown the greatest tendency to increase in price and scarcity during the last two years, but it is stated that a liberal purchasing policy, which anticipated the market, has provided an ample supply of practically all raw materials to meet the demand.

ROLLING STOCK

Manhattan City & Interurban Railway, Manhattan, Kan., is in the market for a number of second-hand double-truck motor cars and trailers, also several 200-kw. rotary converters.

Illinois Traction System, Peoria, Ill., will soon begin the construction of six large electric locomotives in its shops at Decatur, Ill. It is expected that the locomotives will be ready for service early in 1918.

United Railways & Electric Company, Baltimore, Md., noted in the May 12 issue as being in the market for eighty semi-convertible double-truck pay-as-you-enter cars, has placed this order with The J. G. Brill Company.

Salt Lake, Garfield & Western Railway, Salt Lake City, Utah, now being equipped with electricity, will purchase through H. A. Strauss, Harris Trust Building, Chicago, six motor cars and six trail cars, each 56 ft. long. The Salt Lake, Garfield & Western Railway is the successor to the Salt Lake & Los Angeles Railroad, 17 miles long. The road was recently bonded to provide funds to extend it for 3 miles and to equip it with electricity.

Springfield (Mass.) Street Railway, noted in the May issue as being in the market for cars, has specified the following details on one motor and two trailer dump cars which will have an 18-cu.-yd. capacity:

Number	1 motor, 2 trailer
Date of order	May 4, 1917
Date of delivery	July 20, 1917
Builder	Differential Car Co.
Type	3 compartment dump
Weight (total), Motor	52,200 lb.
Trailer	37,500 lb.
Bolster centers, length,	19 ft. 8 in.
Length over bumpers	39 ft. 0 in.
Width over all	8 ft. 2 in.
Body	Steel
Air brakes,	GE. straight and automatic
Axles	Forged steel
Control, type	K-35-G-2
Couplers	Tomlinson MCB.
Fenders or wheelguards	Pfingst
Gears and pinions,	Forged steel, heat treated
Headlights,	Crouse-Hinds "Melobeam"
Journal boxes	Symington
Lightning arresters,	Westinghouse
Motors	4 West. 306-CV, inside hung
Paint	Sherwin Williams No. 4861. Body, grey
Sanders	Murphy
Trolley catchers,	Wilson type "T"
Trolley base	U. S. No. 13
Trolley wheels,	Railway standard
Trucks	Wason arch-bar
Wheels	33 in. cast iron

Oklahoma Union Traction Company, Tulsa, Okla., noted in the April 21 issue as placing an order with the American Car Company, has specified the following details on these six cars which made up part of the order:

	Single-End One-Man Car	Single-End Passenger Smoking and Baggage Car
Number of cars ordered	3	3
Builder	American Car	American Car
Seating capacity	38	56
Bolster centers, length	———	32 ft. 6 in.
Length over bumpers	30 ft. 2 in.	56 ft. 2 in.
Length over vestibule	29 ft. 2 in.	54 ft. 2 in.
Width over all	8 ft. 0 in.	9 ft. 2 in.
Rail to trolley base	12 ft. 6 in.	13 ft. 2¾ in.
Body	Steel	Semi-steel
Interior trim	Statuary bronze	Bronze with mahogany enamel finish
Headlining	None, rafter finish	Agasote
Roof	Arch	Arch
Air brakes	Safety Car Devices Co.	
Axles	Brill	Brill
Bumpers	American Car—Channel iron	G-Co. anti-climber
Car trimmings	Brill	Brill and Dayton Mfg. Co.
Control type	GE. K-10	GE. type PC.
Couplers	None, pull bars used	Tomlinson MCB radial
Curtain fixtures	Curtain Supply	Curtain Supply
Curtain material	Pantasote	Pantasote
Designation signs	Hunter	
Door operating mechanism,	Safety Car Devices—air-operated	
Wheelguards	HB. Life Guards	American Car—steel pilots
Gears and pinions	GE.	GE.
Hand brakes	American Car Co.'s with Pittsburgh ratchet drop brake handles	American Car with Pittsburgh ratchet drop handle
Heaters	Consolidated Car Heating	Peter Smith hot air
Headlights	Golden Glow	Golden Glow T-128
Journal boxes	Brill	Brill
Lightning arresters	GE.	GE.
Motors, type and number,	Two GE. 258-A inside hung	Four GE. No. 201 inside hung
Paint, varnish or enamel	———	American Car
Sanders	Keystone air sanders	Ohio Brass air sanders
Sash fixtures	O. M. Edwards	O. M. Edwards
Seats, style	American Car Co.'s light weight reversible	Brill stationary upholstered in green leather
Seating material	Mahogany wood, steel and canvas lined rattan	
Springs	Brill	Brill
Step treads	Feralun	Feralun
Trolley catchers	Keystone	Retrievers Knutson
Trolley base	GE.	GE.
Trolley wheels or shoes	GE.	GE.
Trucks, type	Brill 21E	Brill 27 MCB-2
Ventilators	Brill exhaust	Utility Ventilator
Wheels (type and size)	33 in.	37 in. Davis cast steel
Special devices	Faraday high voltage push button system	O. M. Edwards steel trap doors

TRADE NOTES

Robert W. Hunt & Company, engineers, Chicago, have offered to the government the services of their entire organization without profit.

Ohio Brass Company, Mansfield, Ohio, has received an order from the Transit Development Company for 3000 straight-line hangers.

Monitor Controller Company, Baltimore, Md., announces that E. Wesley Vaughn has joined the sales organization of its New York offices, of which Joseph Frese is manager.

Western Electric Company, Chicago, Ill., announces that its Seattle (Wash.) branch has moved from 907 First Avenue to 84 Marion Street, where it will occupy a two-story brick building erected especially for the company.

Henry J. Jumonville, certified public accountant, who was formerly general auditor of the American Cities Company and of its subsidiaries, announces the opening of offices for the practice of public accounting in New Orleans, La.

Asbestos Protected Metal Company, Pittsburgh, Pa., announces the appointment of Stanley L. Rau as sub-agent for Grand Rapids and vicinity, working in connection with the Detroit office. Mr. Rau is located in the Powers Theatre Building.

Morgan Crucible Company, New York, N. Y., has moved from 114 Liberty Street to 519 West Thirty-eighth Street. The company's factory is being moved from Brooklyn to New York so that it will not only have larger quarters but also gain the advantage of having factory and office under one roof.

Dunbar Manufacturing Company, Chicago, Ill., is the new name of the company formerly known as the Acme Supply Company. Thomas Dunbar is president, H. U. Morton, vice-president and treasurer, and T. K. Dunbar, secretary. The general offices of the company are at 5133 West Lake Street, Chicago.

Ellsworth L. Mills, formerly head of the track division of the Public Service Commission, First District, has resigned from the firm of Gibbs & Hill, consulting engineers for the commission, and hereafter will be associated with Dilsworth, Lockwood & Company, New York City, in the management of its railway supply department.

Charles A. Schieren Company, New York, N. Y., manufacturer of leather belting, has recently opened branch offices at 72 Congress Street, West, Detroit; 18 South Broadway, St. Louis; 475 South Main Street, Memphis; 272 Marietta Street, Atlanta, in addition to those already established at New Orleans, Dallas, Boston, Philadelphia, Pittsburgh, Chicago, Denver and Seattle.

C. S. Butler has resigned from the Hess-Bright Manufacturing Company, Philadelphia, Pa., after having been associated with it for about seven years, to become sales manager of the Carlson-Wenstrom Company, Richmond Street and Erie Avenue, Philadelphia, a subsidiary of the Carwen Steel Tool Company. Mr. Butler's resignation from the Hess-Bright Company became effective on May 31. The Carlson-Wenstrom Company has a well-equipped plant for making bearings, and intends to manufacture and introduce a new design of high-grade double-row ball bearing and to market a complete line of thrust ball bearings.

Holden & White, Inc., Chicago, Ill., general sales distributers of Hartman centering center plates and Perry anti-friction side bearings, report orders received recently for these bearings from the following railways: Waterloo, Cedar Falls & Northern Railway; Chambersburg, Greencastle & Waynesboro Railway; Philadelphia Rapid Transit Company; Mahoning & Shenango Railway & Light Company; Baldwin Locomotive Company for new cars of the Northern Ohio Traction & Light Company; Denver Tramway Company; Oklahoma Railway; Salt Lake & Utah Railroad; Albany-Southern Railroad; Cedar Rapids & Marion City Railway, and the Oakland, Antioch & Eastern Railway.

Hess-Bright Manufacturing Company, Philadelphia, Pa., announces that it is now and has for some time been booking orders in large quantities for ball bearings which are specified in government contracts with large manufacturers of motor trucks and aeroplanes. Many orders for thrust bearings of the larger sizes specified for use in the building of submarine chasers have also been received. Other contracts, in addition to the annular bearings for battle and training planes, have called for the company's Monarch bearing, which is built under the Conrad patents, recently adjudicated. This bearing will be supplied in quantities for mounting in the hubs, transmissions and steering knuckles of modern high-powered trucks.

Union Switch & Signal Company, Swissvale, Pa., reports a number of recent orders among electric railway companies. Among them is one from the Boston Elevated Railway for material for its Dorchester subway extension. The apparatus will include double impedance bond layouts, track transformers, automatic train stops, Style "L" three-lens light signals and Model 15 vane-type two-position track relays. Another large order is from the Interborough Rapid Transit Company for its Seventh Avenue subway from West Forty-third Street to Wall Street and for the West Farms subway connection and the Pelham Bay Parkway line. This order includes for the Seventh Avenue line two nineteen-lever, two fifteen-lever, two seven-lever and one twenty-three-lever electric-pneumatic interlocking machines, with the attendant automatic stops, alternating current relays, switches, etc. A third recent order is from the United Railway & Electric Company of Baltimore and is to provide signal protection for a drawbridge over Boar Creek in connection with the automatic block installation. A three-lever dwarf machine will be placed at the center of the drawbridge to operate the train stops and the circuit controller for the control of the 600-volt current operating the bridge. Automatic stops will be placed on each track and these will be operated through pipe lines by the dwarf machine on the draw. Home and distant signals of the Model "M" light type will be installed to provide indication. Stick locking operated by a clockwork time release will be installed to insure that the signals indicate stop and that the tripper arms are in the engaging position before the draw can be moved.

ADVERTISING LITERATURE

Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.: Paper on "Chilled Iron Car Wheel" presented before Canadian Railway Club of Montreal, Que., Feb. 13, 1917, by George W. Lyndon.

Remington Typewriter Company, New York, N. Y.: A bulletin on railroad payroll and pay check writing which describes a railroad accounting machine for writing payrolls and pay checks at one writing.

Peter Witt: A bulletin, "The Car Rider's Car." Shows photographs and diagrammatic arrangement of the operation of loading and unloading. The adaptability of this car to a number of cities is discussed and the bulletin contains the opinions of prominent railway men.

American Steel & Wire Company, Chicago, Ill.: Bulletin on preparedness for winter's food supply by Dr. Ernest W. D. Laufer, agronomist. Bulletin is published in hope of making each community as nearly self-supporting as possible in production of food for home consumption.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Leaflet 3977 descriptive of electrical speed indicators for use in power stations, industrial plants and similar applications. Also, leaflet 3324 on potentiometers for the measurement of "hot spots" in electrical apparatus.

Lincoln Electric Company, Cleveland, Ohio: Catalog No. 104 on electric arc welding. Comparisons of costs of arc welding with other systems are given. One section devoted to electric railroad shops has numerous illustrations and descriptions of applications of arc welding that have proved successful.

Underwriters' Laboratories, Chicago, Ill.: A bulletin to its staff signed by W. H. Merrill, president, notifying them of definite plans which have been made by the government for utilizing the company's service of inspection at factories turning out munitions. One recent order by the government is for 1,000,000 ft. of No. 14 Duplex leaded wire for immediate delivery, goods subject to the company's inspection and labeling.

Empty Sacks

"An empty sack won't stand, neighbor," says the Irish farmer when someone tries to sell him a pig in a poke.

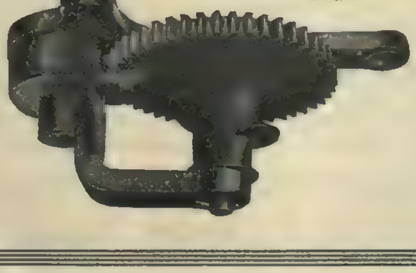
Empty sacks are disguised in all sorts of forms, including brakes.

There's lots of promise on the label, maybe, but the brake won't stand up and make good.

But the shrewd railway man, like the witty farmer, looks beyond the label or claims.

He simply applies that infallible guide—**experience**—and picks the brake which has stood up and made good on so many thousands of cars. There's no empty sack trickery about

PEACOCKS



The Eccentric Drum

National Brake Co.

Buffalo, N. Y.

Bankers and Engineers

Electric Railway Lighting and Power Company Bonds
ENTIRE ISSUES PURCHASED
THE NATIONAL CITY CO.
NATIONAL CITY BANK BUILDING
55 WALL STREET, NEW YORK

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ENGINEERS—CONSTRUCTORS
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VALUATIONS AND FINANCIAL REPORTS
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ELECTRICAL TESTING LABORATORIES
Electrical, Photometrical and Mechanical Testing.
80th Street and East End Ave., New York, N. Y.

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ENGINEERS CONTRACTORS
FINANCIERS OPERATORS
43 EXCHANGE PLACE . . . . NEW YORK
LONDON SAN FRANCISCO CHICAGO

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An organization prepared to handle all work which calls for the application of chemistry to electric railway engineering—such as the testing of coal, lubricants, water, wire insulation, trolley wire, cable, timber preservatives, paints, bearing metals, etc.
Correspondence regarding our service is invited.
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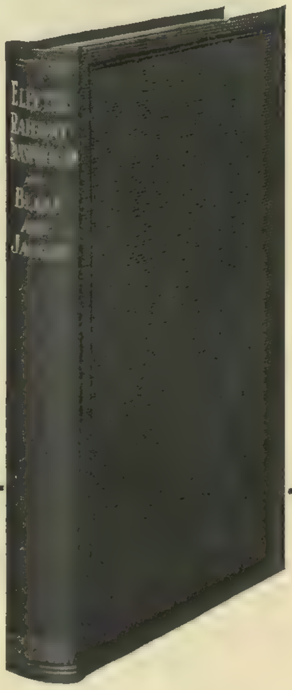
For Improved Transportation Methods and Better Earnings

Developments in transportation methods, under the stimulus of the new prepayment-car designs, have been very rapid in the past few years. The most striking of these new transportation methods are described in this new book, and their effects on earnings are shown.



Now Ready

Electric Railway Transportation

By **Henry W. Blake,** Editor, Electric Railway Journal, and **Walter Jackson,** Business Manager, formerly Assoc. Editor, Electric Railway Journal.

This is the first book to cover the transportation side of the electric railway business—

Getting the cars over the track.
Increasing the traffic.
Collecting the fares.

Messrs. Blake and Jackson have had exceptional opportunities in connection with the Electric Railway Journal to study the developments in transportation methods. They give you the crystallized experience of a large number of roads.

The importance of the work to transportation officials and other executive officers of electric railways needs no emphasis. Increased efficiency in methods, and improved equipment, are vital to electric railways in meeting the present difficult situation.

The book will appeal to all electric railway officials who have anything to do with operation, and also to those interested financially.

487 pages, 6x9, 120 illustrations, $5.00 net, postpaid.

A New Book on Rate-Making

Public Utility Rates

By **Harry Barker,** Associate Editor, Engineering News-Record, Member A.I.E.E.

A complete survey of the whole problem of public utility rates is given in this book. It covers fully the principles and practice underlying charges for water, gas, electricity, communication and transportation service.

Because of the broad manner in which the whole subject is treated, this book possesses exceptional value to consulting engineers, public commissioners, and company officials.

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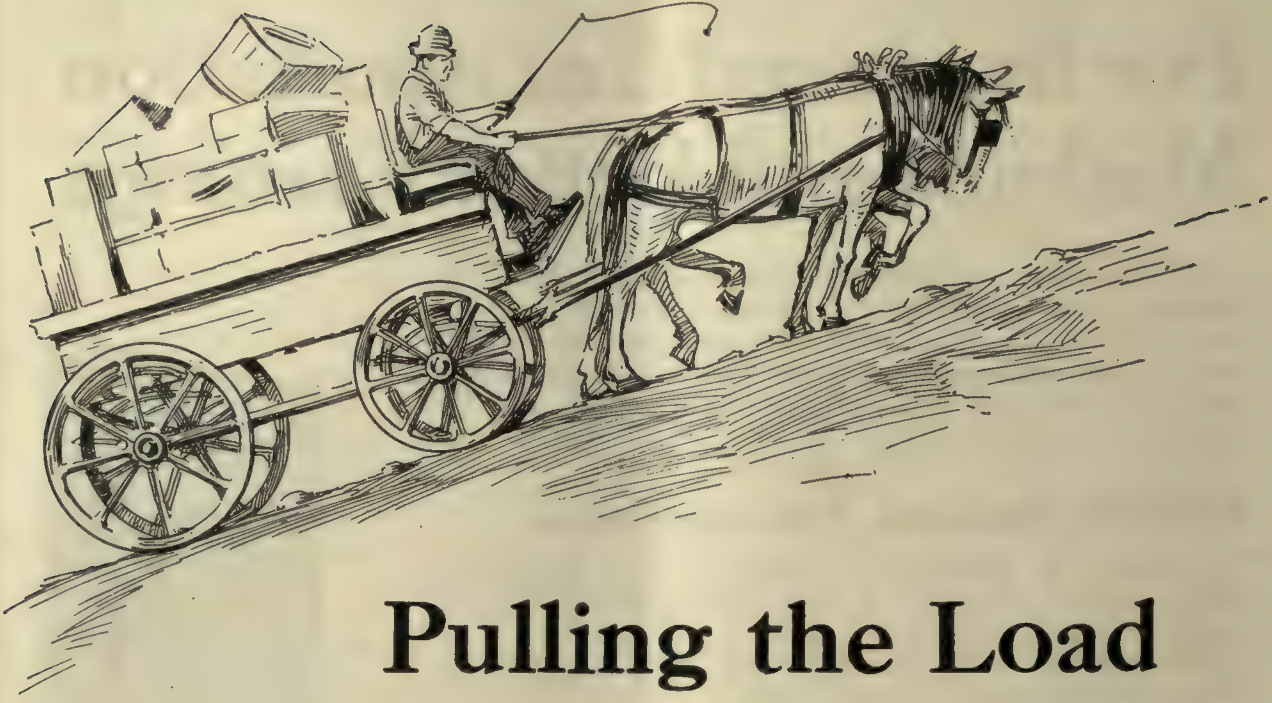


Pulling the Load

Down hill and on the level, a load moves easily; but up a grade it is a hard pull. You wouldn't try to move a load up hill with the brakes set. But that is the practice in many powerhouses. Any ordinary oil answers the purpose fairly well when the engines are running light, but when the load comes on and the pull is up hill, then every bearing should turn with the minimum of friction —you need the best oil you can buy.

Specially compounded of the finest materials to meet the severest service, Galena Oils are unequalled for powerhouse lubrication. They are so exceptionally good that we stand back of them with a guarantee of service and cost.

Galena-Signal Oil Co.

Franklin, Pa.

We Have Many Irons in the Fire

But each kind of iron (or product) is watched by a specialist.

That's at the bottom of Columbia success, for our organization has a Jack for each trade.

The department for turning out trolley poles, for instance, is just as distinct from the gear cases as the hardware is from the silks in a high-class department store.

Therefore, when you order any of the following products you are assured that they will be made by specialists:

TOOLS

Armature and Axle Straighteners
Armature shaft straighteners
Armature buggies and stands
Babbitting molds
Bending and heading machines
Car hoists
Car replacers
Coil taping machines for armature leads
Coil winding machines
Pinion pullers
Pit jacks
Signal or target switches
Tension stands

CAR EQUIPMENT

Armature and Axle Bearings
Armature and field coils
Bearings (Axle and Armature)
Brush-holders and brush-holder springs
Brake, door and other handles
Brake forgings, riggings, etc.
Car trimmings
Commutators
Controller handles
Forgings of all kinds
Gear cases (steel or mall. iron)
Grid resistors
Third-rail shoe beams and accessories
Trolley poles (steel) and wheels

Columbia Machine Works & Malleable Iron Co.

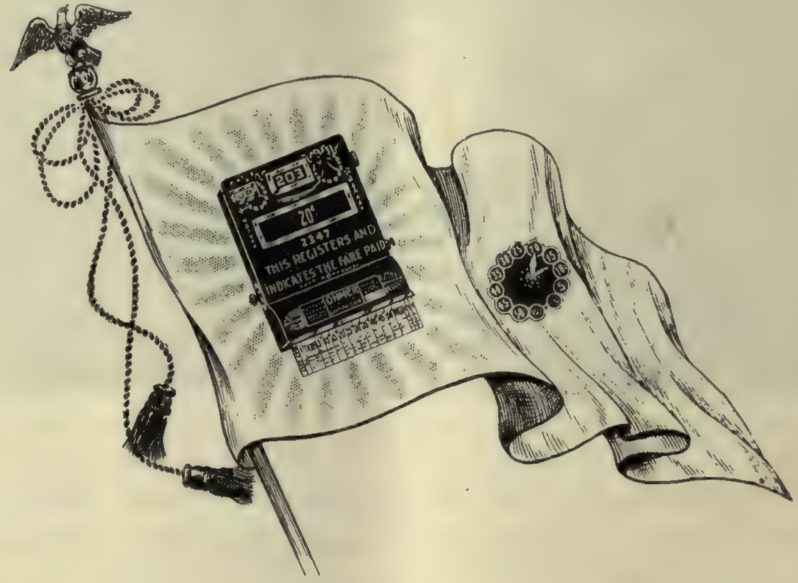
Atlantic Ave. and Chestnut St., Brooklyn, N. Y.

W. R. Kerschner Co., Inc., N. Y. Holden & White, Inc., Chicago F. F. Bodler, San Francisco

ENLIST

Enlist today in the training camp for efficient business service.

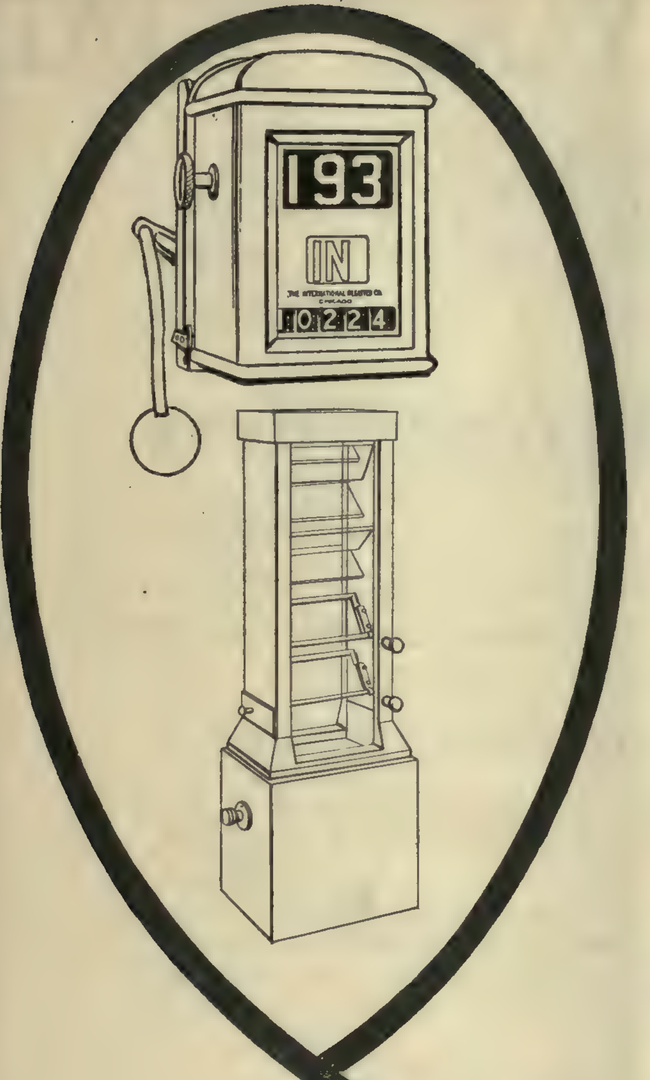
You are needed as an officer in the fight for better business. Your industry needs your example. Your men need your leadership. Will you do your bit?


203
20¢
2347
THIS REGISTERS AND INDICATES THE FARE PAID
OHMER

Have you a well developed plan and system for operating your business in these trying times? Have you a system based upon clean cut business principles? Have you a system which has stood the crucial test of business battles through years of aggressive campaigns? Have you a system that will insure your complete victory?

After sixteen years of competitive warfare the flag of the **Ohmer Fare Register and System** is impregnably mounted upon the pinnacle of business success in every state in the Union.

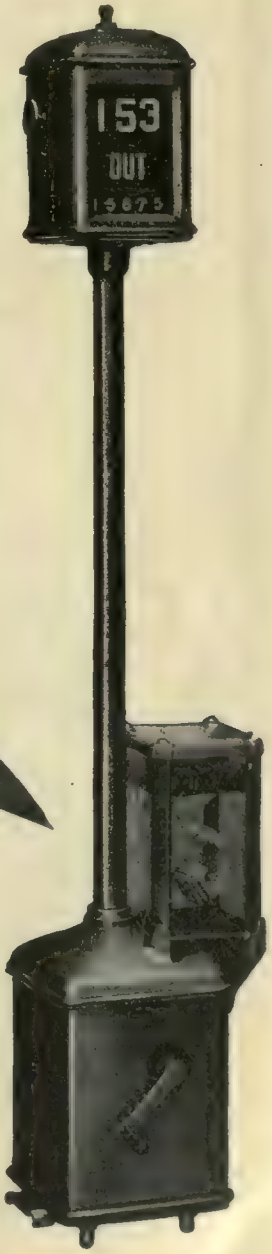
OHMER FARE REGISTER COMPANY
DAYTON, OHIO



The International Combination replaces fallible human with

INFALLIBLE MECHANICAL REGISTRATION

The International combination of fare box and register—called Coin Register—makes it absolutely certain that every fare deposited is also registered.



Why expect from the conductor the practically impossible task of separate registration of each fare as deposited, thus doubling his work, when a mechanically perfect method is available to produce simultaneously a count of passengers at the Fare Box and the registration in money value of the amount deposited?

Can you expect a conductor engaged in making change, issuing transfers, operating doors and steps, calling streets and giving signals to add to all these duties that of the double registration of fares without error?

The International Coin Register insures proper registration, both of passengers and fares, and it can't make a mistake, as it is never flustered, angry, forgetful or overworked.

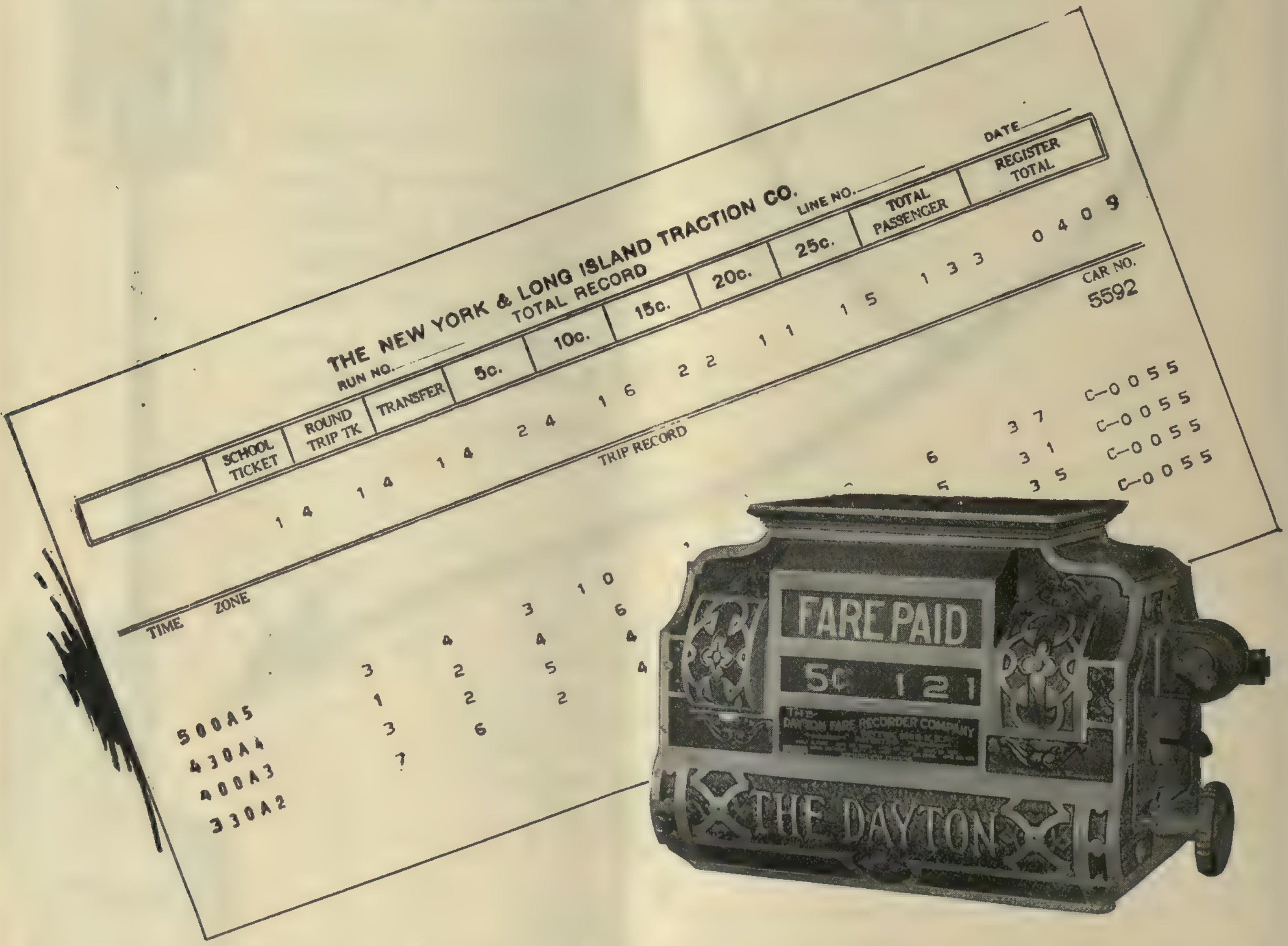
The International Register Company
15 South Throop Street, Chicago

DAYTONIZE YOUR ROAD

Do away with clerical drudgery in fare collection. Your conductors aren't accountants—they can make mistakes. There's only one reliable, efficient fare recording system. That's accomplished with

Dayton Fare Recorders

You get a complete record at the end of the day's run that's an absolute check on your system—and it's all done automatically and mechanically—there's no possibility of error. Here's a sample of a Dayton Fare Record.



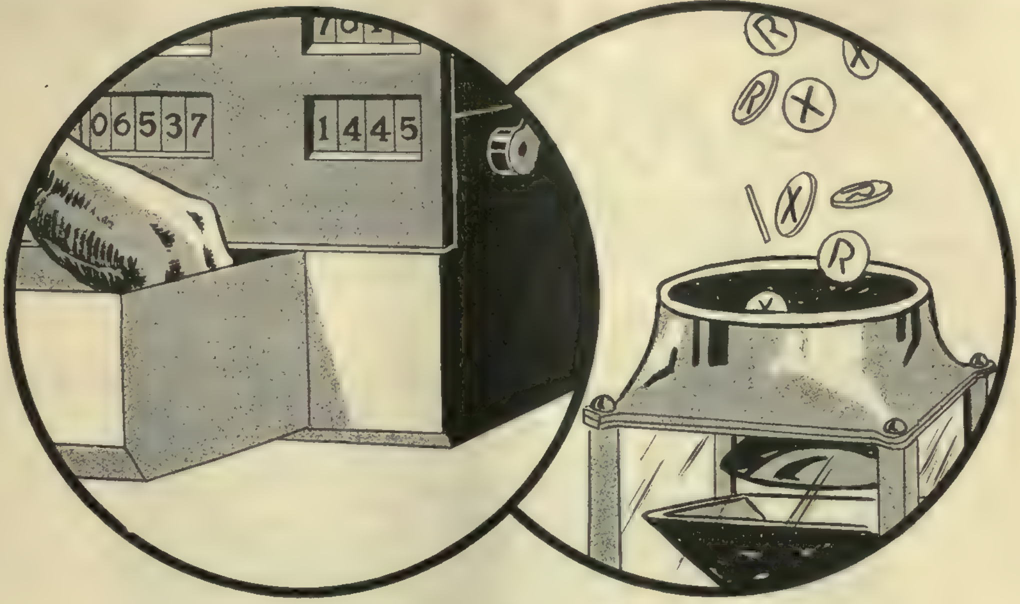
THE NEW YORK & LONG ISLAND TRACTION CO.
TOTAL RECORD
RUN NO.
LINE NO.
DATE
CAR NO. 5592

SCHOOL TICKET	ROUND TRIP TK	TRANSFER	5c.	10c.	15c.	20c.	25c.	TOTAL PASSENGER	REGISTER TOTAL
1 4	1 4	1 4	2 4	1 6	2 2	1 1	1 5	1 3 3	0 4 0 9

TRIP RECORD
TIME ZONE
5 0 0 A 5
4 3 0 A 4
4 0 0 A 3
3 3 0 A 2
C–0 0 5 5
C–0 0 5 5
C–0 0 5 5
C–0 0 5 5

The Dayton
Fare Recorder Company

Dayton, Ohio, U. S. A.



—and the tokens are immediately Available for Re-sale

Above all things, any fare-collection system embodying the use of metal ticket-tokens must be *flexible*. The tokens must not be allowed to accumulate in the company's possession—they must be kept constantly in circulation. This is one of the many features which have put

The Johnson Fare Box and Metal Tickets

head and shoulders above all other systems of fare collection. The Johnson Fare Box accepts and counts with equal ease all the usual coins and also metal ticket-tokens representing, if necessary, two different rates of fare.

As soon as the fares have been counted and registered, the mechanism releases the ticket-tokens to the conductor for re-sale; they are thus kept in constant circulation.

Remember, also, that in the Johnson System, cash fares and metal tickets are handled through *one* hopper—this not only prevents errors and disputes, but materially accelerates fare collection and thereby improves schedules.

These features, together with a token so distinctive as to make counterfeiting extremely difficult, combine to make the Johnson System ideal for roads of all kinds and sizes.

Write for complete details.

Johnson Fare Box Company
Jackson Boulevard and Robey St., Chicago
50 East 42nd Street, New York

It Is Desirable that All Trucks Be
EQUALIZED

Baldwin Trucks on the London and Port Stanley Ry. are equalized.
The Result—See copies of the letters shown below.

Hydro-Electric Power Commission
of Ontario
Engineering Department

Col. Sir Adam Beck, K.B. LL.D. Chairman
Hon. I. B. Lucas Commissioner
Col. W. K. McNaught C.M.G. Commissioner
Frederick A. Gaby Chief Engineer

190 University Avenue,
Toronto

May 14th, 1917

ADDRESS REPLY ATTENTION OF
Railway Division

Mr. S. A. Bullock,
Manager Truck Department,
Baldwin Locomotive Works,
Philadelphia
Pa.

Dear Sir:-

RE: LONDON AND PORT STANLEY RAILWAY
MOTOR CAR TRUCKS

In response to your recent inquiry regarding trucks supplied on London and Port Stanley Railway cars some two years ago, I beg to advise so far they have given us very good service.

I am attaching hereto a letter from Mr. Lenhart, Master Mechanic of the L. & P. S. stating that they are satisfied with these trucks. You will also find enclosed photographs Nos. "A" 94 and "A" 101, which are views of cars equipped with your trucks.

If you require any further information I will be pleased to supply it upon your request.

Yours truly,

WGH.EP HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

ENCLOSURE

Chief Engineer

THE LONDON AND PORT STANLEY RAILWAY

COPY

London Apr.16th,1917

Mr. F.A.Gaby,
Chief Engineer,H.E.P.C.
190 University Ave.
Toronto, Ont.

Dear Sir:-

BALDWIN TRUCKS

In reply to your letter of the 13th, asking for our experience with the Baldwin Trucks under cars Numbers 2 to 10 inclusive; beg to say that we are having most gratifying results.

During periods of overhauling, I find these trucks in perfect alignment, all bolts intact, and no perceptible change in their excellent riding qualities. The cost of maintenance thus far can be considered negligible.

Yours truly,
Sgd.C.E.Lenhart
Master Mechanic

THE BALDWIN LOCOMOTIVE WORKS
Philadelphia, Pa.

REPRESENTED BY

F. W. Weston, 120 Broadway, New York, N. Y.
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C. H. Peterson, 1210 Boatmen's Bank Bldg., St. Louis, Mo.
George F. Jones, 407 Travelers' Building, Richmond, Va.
A. Wm. Hinger, 512 Northwestern Bank Bldg., Portland, Ore.
Williams, Dimond & Co., 310 Sansome St., San Francisco, Cal.

RELIABILITY - PERMANENCE - ECONOMY.

OKONITE

TRADE MARK
REG. U. S. PATENT OFFICE.

The STANDARD for RUBBER INSULATION

Railway Feed Wires insulated with OKONITE are unequaled for flexibility, durability, and efficiency, and are in use by the leading Electric Street Railway Companies. OKONITE is preferred above any other insulation for Car Wiring, Telegraph and Telephone Purposes.

OKONITE WIRES—OKONITE TAPE
MANSON TAPE—CANDEE WEATHERPROOF WIRES
CANDEE PATENTED POTHEADS

Samples and Estimates on Application

THE OKONITE COMPANY, 501 Fifth Ave., cor. 42nd St., New York

CENTRAL ELECTRIC CO., Chicago, Ill., General Western Agents

F. D. Lawrence Electric Co., Cincinnati, O. **Novelty Electric Co., Philadelphia, Pa.** **Pettingell-Andrews Co., Boston, Mass.**

TROLLEY WIRE

Round Grooved and Figure 8

If you will agree that one make of trolley wire is able to give longer service than another make—

That one is more economical than another—

Then investigate our trolley wire with a view to cutting your wire costs.

STAR BRAND
Made to Wear To Wear Well
WEATHER-PROOF WIRE

Weatherproof Wires and Cables

Star Brand

Star Brand Wires are made with long service as the most prominent feature.

Because of their ability to render long service they cut wire costs.

Read the words in the cut of the star.

American Electrical Works

NEW YORK: 165 Broadway
CHICAGO: 112 West Adams Street
BOSTON: 176 Federal Street

Phillipsdale, R. I.

CINCINNATI: Traction Building
SAN FRANCISCO: 612 Howard Street
SEATTLE: 1002 First Avenue South

3105

"More than one-half of preparedness consists of information." "He who is well informed is rarely unprepared."

We want you to have the information about

White's
Porcelain Trolley
Hanger

We want you to be prepared to take advantage of the time and labor saving which is offered by this simple three-piece hanger.

Let us send you a sample which will convince you, even more than the view shown above, that this hanger is easy to hang and easy to align on the wire.

The sherardized yoke and the heavy glazed porcelain insulator will convince you that it will give you the service on the wire.

The "stud" is a standard bolt, sherardized or furnished in bronze. The only part that ever wears out —and you can buy standard studs anywhere.

We can make

Immediate Delivery

on complete hangers or parts. Let us send you the sample and quotations.

T. C. White Electrical Supply Co.

1122 Pine Street, St. Louis, Mo.

Foreign Representatives: Forest City Electrical Service Supply Co., Salford, England.

YALE

The Yale Triplex Block in a Railroad Storeroom.

The Yale Triplex Block

Yale Hoists
built with knowledge

Rugged parts put together with knowledge make Yale Hoists.

Each part—its shape, size and material—is based on thorough study and understanding; to add a part or take a part away would spoil a perfect hoist.

The Yale Triplex Block is the result of nearly fifty years' experience in building good chain blocks.

For sale by Machinery Supply Houses

Put your hoisting problems up to us
ASK FOR NEW CATALOG

For factory locking equipment use a Yale Master-key System Write us for particulars.

The Yale & Towne Mfg. Co.

9 East 40th Street
New York

How many pieces of apparatus did you have wrecked by lightning last summer?

Do you know now how expensive is cheap arrester equipment?

AJAX

Lightning Arresters

will prove cheapest by giving greatest service. The expense of one wrecked piece of equipment will more than pay for the initial cost of AJAX Protection.

Don't wait until the horse is stolen—
Write now for bulletins on the Anderson line.

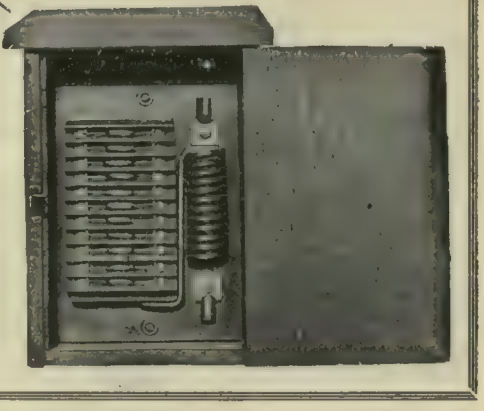
ALBERT & J. M. ANDERSON MFG. CO
289-293 A STREET, BOSTON, MASS., U. S. A.

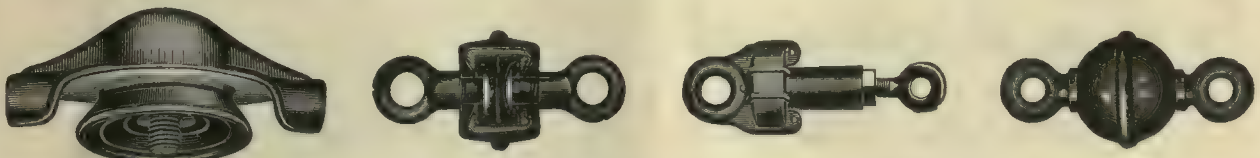
NEW YORK
135 Broadway

PHILADELPHIA
429 Real Estate Trust Bldg.

CHICAGO
105 S. Dearborn St.

LONDON, E. C., 48 Milton St.





You Can Minimize Overhead Repair Work

and successfully cut maintenance costs if you turn to

The Macallen Line

of strain insulators, hangers, splicing ears, crossings, and other overhead material.

They are "specialty" products, designed and built to make "Macallen" the standard on American railways.

It will pay you to write for information and prices.

The Macallen Insulating Joint

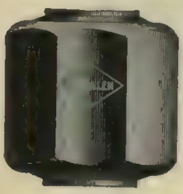
Adopted by principal air brake manufacturers as part of their standard equipment. Also insulates steam pipes, etc. Shell is seamless drawn steel, nipples are machined from steel rod, and insulating material is Macallen Vulcanite Compound, not affected by heat or oil—practically indestructible.

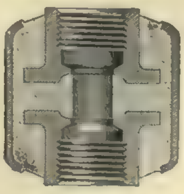
May We Send Our Catalog?

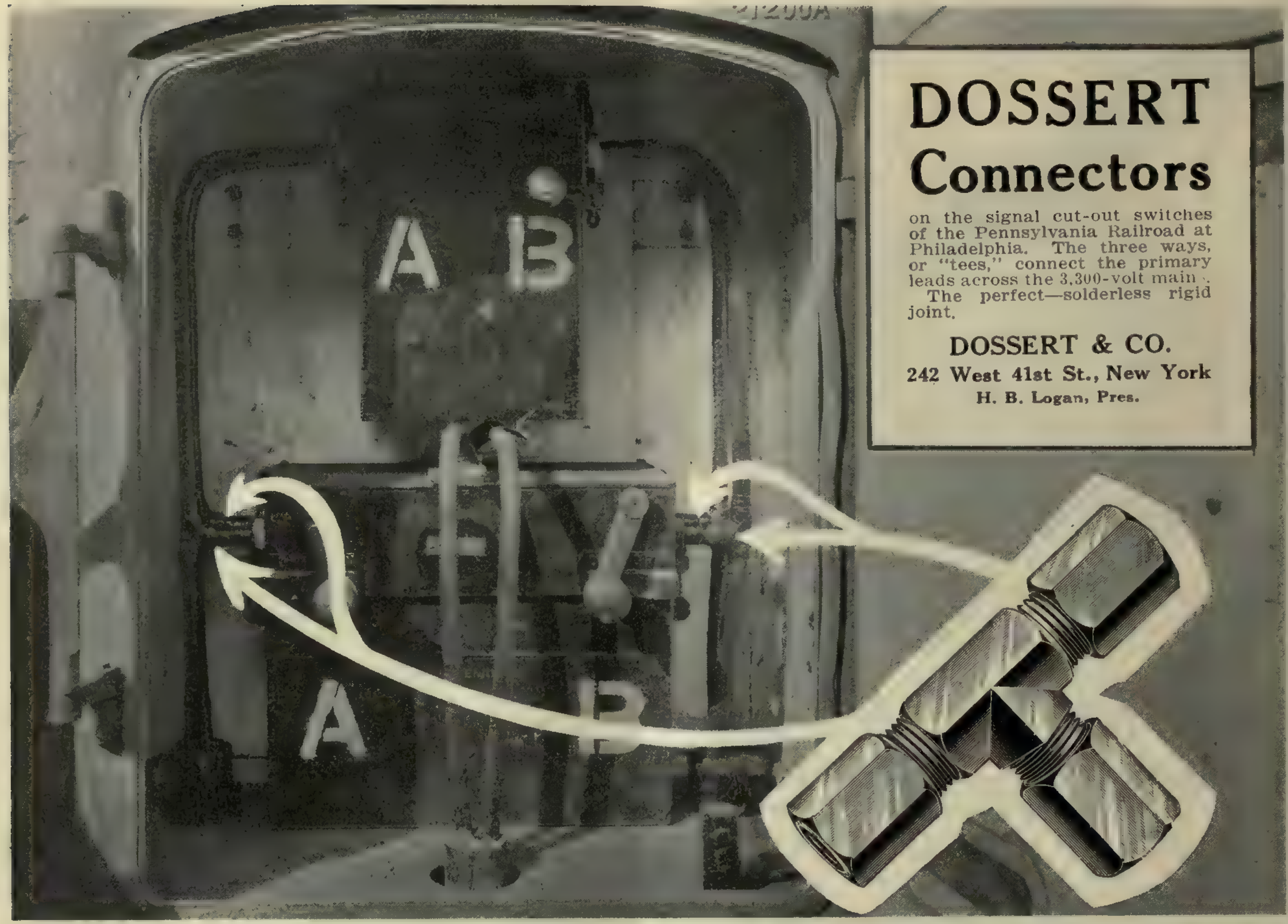
TRADE MACALLEN MARK.

The Macallen Company
Macallen and Foundry Sts., Boston

TRADE MACALLEN MARK.







DOSSERT
Connectors

on the signal cut-out switches of the Pennsylvania Railroad at Philadelphia. The three ways, or "tees," connect the primary leads across the 3,300-volt mains. The perfect—solderless rigid joint.

DOSSERT & CO.
242 West 41st St., New York
H. B. Logan, Pres.

Is this a view of YOUR tracks?

It's a call for
ATLAS "A" Weed Killer

If you believe in efficient generating machinery and an efficient working organization—then apply the same belief to your *weed killing.*

Hand weeding of tracks is about as inefficient a method as you can use. It's high in cost and feeble in results.

Atlas "A" is an EASY chemical method of weeding tracks.

—it is LOW cost and PERMANENT.

—it entails no cash outlay for equipment.

It has behind it your most important consideration—the testimony of roads as to the value of our service.

Write us for the ATLAS "A" proposition.

Atlas "A" will PERMANENTLY clear your tracks

Chipman Chemical Engineering Co., Inc., 95 Liberty St., New York

If it's a **NUT** *make it a*

ROLLER SELF-TIGHTENING LOCK NUT

and eliminate motor inspection

ROLLER LOCK NUT CO. N.Y.
Part of Steel Cover Removed to Show Locking Roller and Brass Arm

because

Once put on they stay tight.
Self tightening feature takes up play.
Do not injure bolt thread in use or removal.
Put on and taken off like an ordinary nut—no larger.
No washers or lock washers required.
Hexagon or Square Type.
Put on a Roller and forget it.

61 Broadway, New York ROLLER LOCK NUT CO., 9 No. Jefferson St., Chicago

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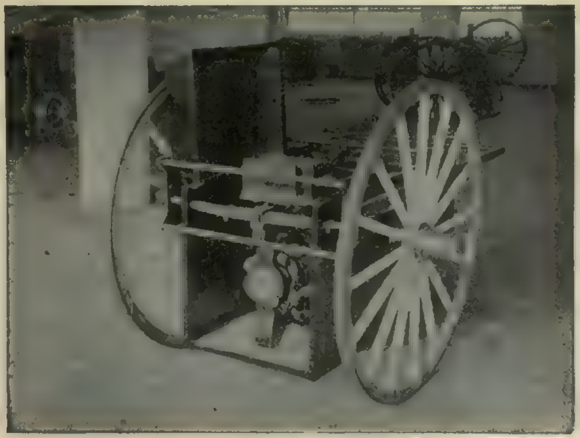


Bonds that Soak into the Rail

Ink soaking into blotting paper is an exact analogy of

Lincoln Electric Arc Bonding

Lincoln bonds soak in—become one with the rail-ends. A weld like this can't shake loose. Maintenance managers can appreciate this. It means much labor saved. It means more power saved.

Lincoln Bonding Outfits are made in two types—Railriding and portable.

Send for bulletins!

The Lincoln Bonding Co.
636 Huron Road, Cleveland, Ohio

AGENTS:
LEWIS & ROTH COMPANY, 1012 Liberty Bldg., Philadelphia, Pa.; 114 Liberty St., New York City, N. Y.
CHARLES N. WOOD COMPANY, 14 Federal St., Boston, Mass.
HOLDEN & WHITE, Inc., 343 S. Dearborn St., Chicago, Ill.
W. C. BURDICK, 808 First National Bank Building, Milwaukee, Wis.

500,000 Service Applications

without appreciable wear

This record of the

Allis-Chalmers

Type "C"

Engineer's Valve

was made under exact service conditions. Half a million applications and releases—at 90 pounds pressure—and the parts showed no sign of wear.

Write for Complete Description

Allis-Chalmers Manufacturing Company

Milwaukee, Wisconsin

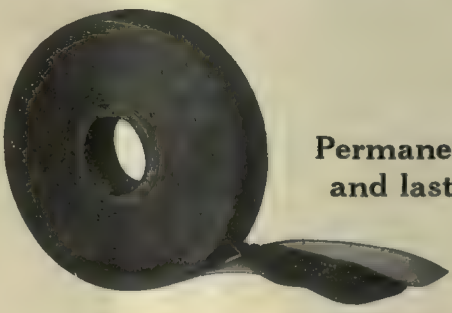
OFFICES IN ALL PRINCIPAL CITIES

CANADIAN REPRESENTATIVES

Canadian Allis-Chalmers Ltd., Toronto, Ont.

BUCKEYE SPLICING TAPE

No better insulating tape —Not affected by extreme temperatures



Permanent fabric strength and lasting adhesiveness

"Where Quality Counts"

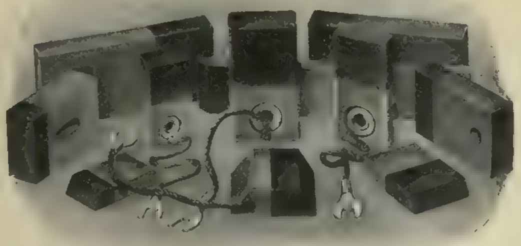
IN THE RAILWAY and CONTRACTING FIELD

There must be quality in each essential part to make a complete quality whole—reliable tape—friction or splicing—means a dependable finished splice.

Are you experimenting, or using a brand of tape upon which you can rely for service?

The Mechanical Rubber Co. ***Cleveland, Ohio***

Your commutators reflect the performance of your brushes



If you use

DIXON'S Graphite Brushes

their perfect service will be reflected in the polished smooth surface they will produce on the commutators of your generators and rotaries.

Dixon brushes are non-scratching—they're self-lubricating; it's impossible for them to score commutators.

And they're eminently suitable for railway station service because graphite brushes adapt themselves peculiarly well to high voltage work.

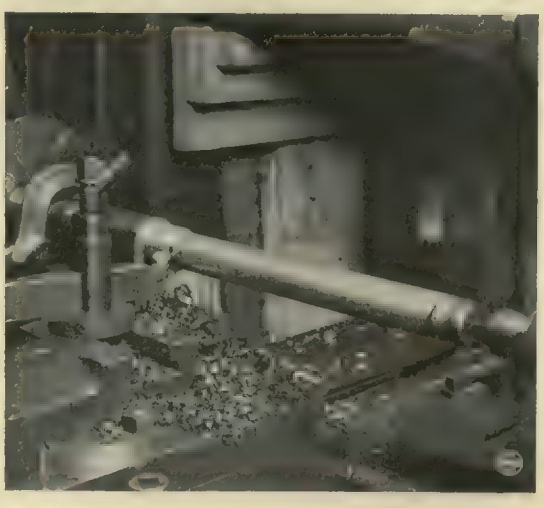
Let us send you prices on your particular type.

Address Department 108-M.

Made in JERSEY CITY, N. J., by the

Joseph Dixon Crucible Company

Established 1827



A Lathe Tool Correctly Ground is a Money Saver

The most satisfactory wheels in actual practice for grinding lathe and planer tools of high-speed steel are medium grades M, N, O and P in Alundum, the grain ranging from as coarse as 20 in the larger wheels to as fine as 80 in the small ones.

A careful analysis of grinding wheel sales for tool grinding shows that for high-speed steel, when used for off-hand grinding on bench and floor stands at approximately 4500 surface feet, our standard recommendations of grain and grade for Alundum wheels should be as follows:

Wheels 4 to 6" diameter, 80 M Alundum Vitrified.

Wheels 6 to 10" diameter, 46 to 60 M and N Alundum Vitrified.

Wheels 10 to 14" diameter, 46 N or 36 O Alundum Vitrified.

Wheels 14 to 24" diameter, 30 and 36 O Alundum Vitrified; also 24 and 30 P Alundum Vitrified and Silicate.

Wheels over 24" diameter, 24 P Alundum Silicate.

This analysis also shows that wheels most commonly used on the principal tool grinding machines are as follows:

Automatic Grinding

Gisholt	20 M and N.	Alundum	Vitrified
	24 M to P	"	Silicate
Sellers No. 1	20 and 24 L and M	"	Vitrified
	20 and 24 L and M	"	Silicate
Sellers No. 2	36 L	"	Vitrified
	30 and 36 M	"	Silicate
Taylor	24-O	"	Silicate

Hand Grinding

Blount	30-O	Alundum	Vitrified
Diamond	24 to 30-O and P	"	Silicate
	30-O	"	Vitrified
Leland and Faulconer	30-O	"	Vitrified
	46 N	"	Vitrified
Whitney	30-O	"	Vitrified
	24 P	"	Silicate

Norton Company

Worcester, Mass.

TRADE MARK NORTON REGISTERED

NEW YORK STORE:
151 Chambers Street

CHICAGO STORE:
11 N. Jefferson Street

838

THE FORD TRIBLOC

Get into the Charmed Circle

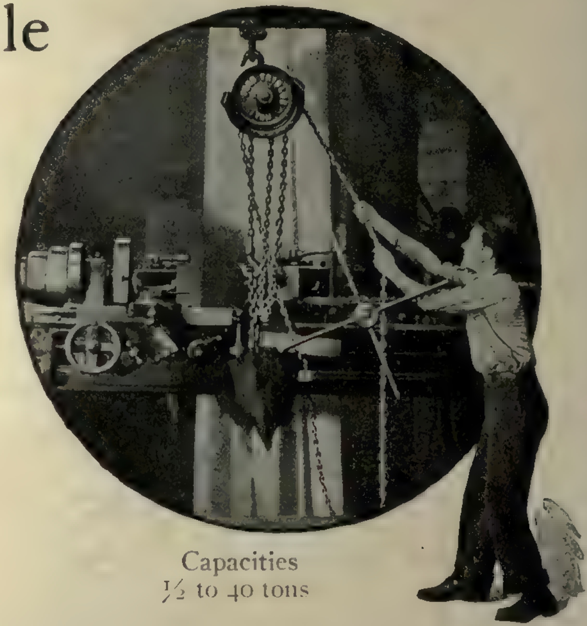
GET into the charmed circle the Ford Tribloc Chain Hoist has drawn around hoisting work.

We say charmed because that word best describes the easy action and absolute safety of a Ford Tribloc. Eighty per cent of the power applied to the hand chain is converted into lifting energy, due to the efficient planetary type of spur gearing. One hundred per cent safety is the result of all-steel parts.

The non-gagging feature of a Ford Tribloc Chain Hoist is worth bragging about.

Completely described in our Catalog.
Yours for the asking.

Ford
of Philadelphia



Capacities
½ to 40 tons

FORD CHAIN BLOCK & MANUFACTURING CO.

142 Oxford St.
PHILADELPHIA, PA.

---

30 Ton
Portable
Hydraulic
Bushing
Press

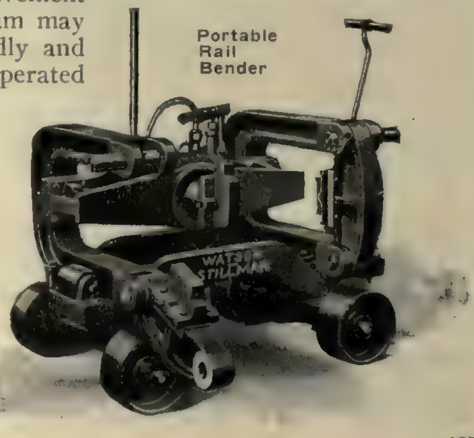
Replace Manual Labor with HYDRAULIC TOOLS

These are two of our large line of hydraulic tools especially designed for railway use, such as pipe benders, rail benders, bending presses, shears, lifts, jacks, etc.

This open jaw portable forcing press is handy for forcing sleeves, bushings, mandrels and similar work. It is a self-contained tool, the power being supplied by a detachable hand power pump mounted at the side of the press in a convenient position of operation. The ram may be brought to the work rapidly and returned by a rack and pinion operated by hand lever shown in cut.

This rail bender is recognized as standard by many railroads. It is powerful, easily handled and will make any bend without buckling rail. We build these in a number of sizes, hand, power or motor driven.

Write for catalogs



Portable
Rail
Bender

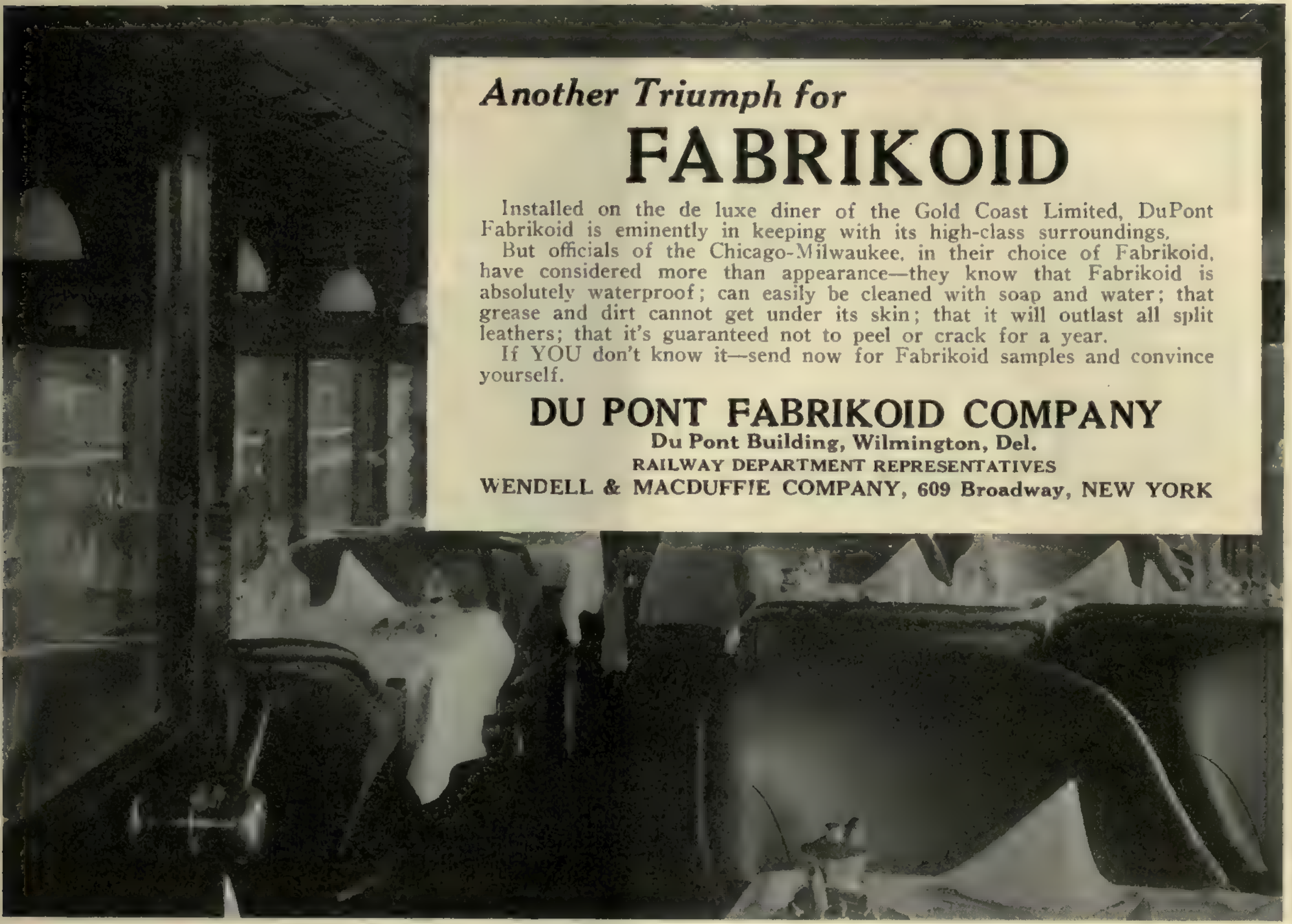
THE WATSON-STILLMAN CO.
46 Church Street, NEW YORK

W-S HYDRAULIC

Chicago, McCormick Bldg.
Pittsburgh, Brown & Zortman.
Kansas City, Geo. T. Cook.
Denver, L. C. Ulrich.

W-S HYDRAULIC

377



Another Triumph for

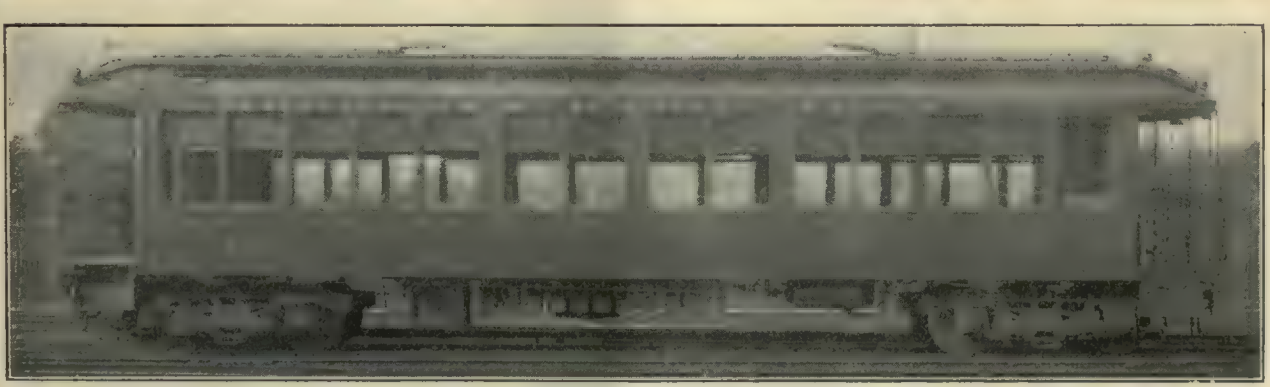
FABRIKOID

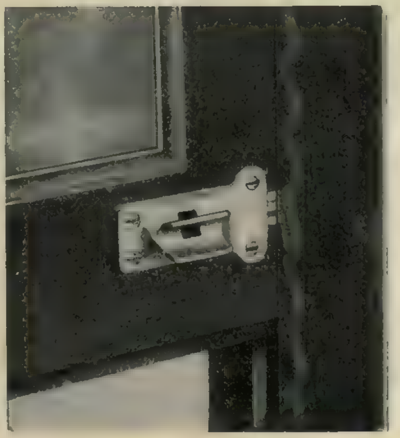
Installed on the de luxe diner of the Gold Coast Limited, DuPont Fabrikoid is eminently in keeping with its high-class surroundings.

But officials of the Chicago-Milwaukee, in their choice of Fabrikoid, have considered more than appearance—they know that Fabrikoid is absolutely waterproof; can easily be cleaned with soap and water; that grease and dirt cannot get under its skin; that it will outlast all split leathers; that it's guaranteed not to peel or crack for a year.

If YOU don't know it—send now for Fabrikoid samples and convince yourself.

DU PONT FABRIKOID COMPANY
Du Pont Building, Wilmington, Del.
RAILWAY DEPARTMENT REPRESENTATIVES
WENDELL & MACDUFFIE COMPANY, 609 Broadway, NEW YORK





Chosen for Safety and Efficiency by the Brooklyn Rapid Transit

Everything for the safety, convenience and comfort of passengers receives careful consideration in the selection of equipment for this great railway—and it chose "Edwards" as the "safety and efficiency" sash fixture for hundreds of its big cars.

There's a world of merit in Edwards Sash Fixtures. Specify them for *your* cars today.

Our Catalog gives the details. Ask for a copy.

The O. M. Edwards Co., Inc. Syracuse, N. Y.

Window Fixtures
Top, Bottom and Side Weather Stripping
Metal top Casings
Metal Extension Platform Trap Doors
All-Metal Sash Balances and Shade Rollers
Railway Devices

What you get in

Efficiency

Accuracy

Reliability

Long-service

Low-maintenance

Catchers and Retrievers

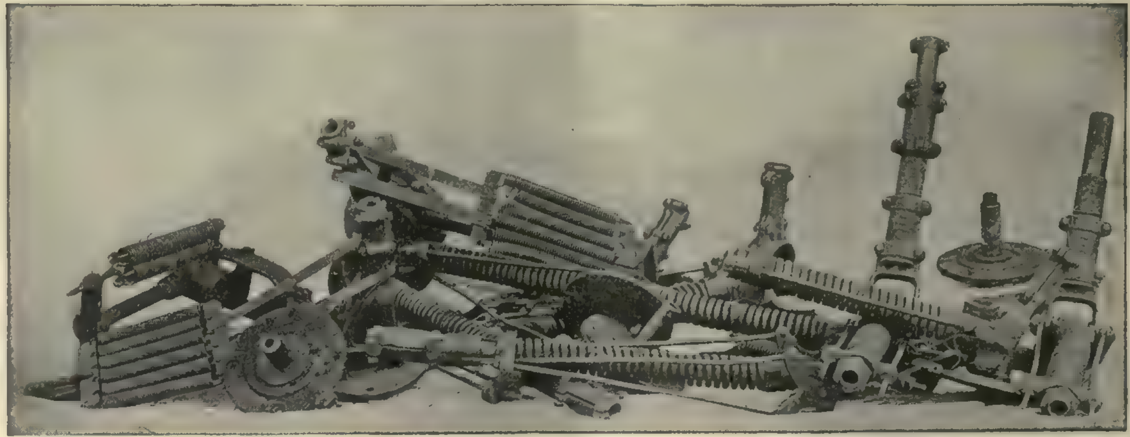
C. I. EARLL

Offices, 11 Broadway, New York
Factory, York, Pa.

W. R. Kerschner Co., Inc.
50 Church St., New York, N. Y.
Electrical Material Co.,
618 W. Jackson Boul., Chicago, Ill.
Brown & Hall Supply Co.,
1515 Pine St., St. Louis, Mo.
The O. H. Davidson Equipment Co.,
1633 Tremont St., Denver, Colo.
Kierulff & Co.,
757 So. Los Angeles St.,
Los Angeles, Cal.

Find out about the catchers and retrievers that have been foremost in the field for over 15 years. Catcher types No. 7 and No. 10. Retriever types No. 4A and No. 5A. Write for bulletin M.

A Ton of Money or a Ton of Scrap?



EVERY wornout trolley base in this pile is worth a definite cash price if returned to us. Write for full particulars of our

Trolley Trade Deal

Nuttall - - - Pittsburgh

For High Speed Operation

—Large Diameter Kalamazoo Trolley Wheels

As a solution to arcing and short wheel life on high speed electric railway work, two new Kalamazoo Wheels have been designed.

They are (No. 20) 11½ inches and (No. 21) 10 inches in diameter. An ample increase of width, depth of groove and length of hub insures a well-balanced wheel in each case.

Tests covering considerable mileage at high speeds show that these two new "Kalamazoos" greatly decrease sparking, while offering longer wheel life. There is more bearing on the wire, with consequent greater contact and current carrying capacity.

The patented Kalamazoo Harps have been enlarged to carry these wheels.

Try several on your lines. Compare their service with that of smaller wheels.

Write Today.

STAR BRASS WORKS

KALAMAZOO, MICHIGAN

Mr. General Manager:

How will conscription affect your supply of maintenance labor?

Will any of your Brake Adjuster Men be called?

If so, you can fill their places with S-W-B Automatic Adjusters. If not put them at more useful work than winding up turnbuckles.

To cite English effects, we quote from Aera of April, 1917—Page 989:

> "Skilled men were called away from the repair shops to the munition factories to such an extent that it became virtually impossible to carry on satisfactorily the absolutely essential work of maintenance and repair."
>
> How about this?

Yours truly,

Smith-Ward Brake Company

New York City

Did it ever occur to you that
Carbon Brushes speak for themselves?

A bad brush is howling and screeching all the time:

"I'm Bad, I'm Bad, I'm Bad!"

While a good brush is declaring all the time:

"I'm Good, I'm Good, I'm Good!"

Le Carbone Carbon Brushes literally talk for themselves:

**"I'm Good,
I'm Good,
I'm Good!"**

Pittsburg Office:
636 Wabash Building

W. J. Jeandron
173 Fulton Street
New York City

Canadian Distributors
Lyman Tube & Supply Co., Ltd.
Montreal and Toronto

Like Master, Like Man

BOYERIZED Pins and Bushings

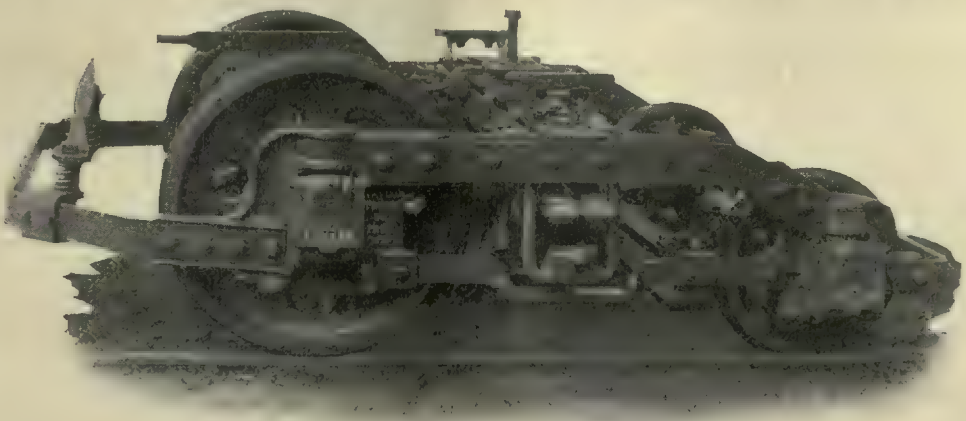
When you make Boyerized pins and bushings standard for your trucks and brake rigging, you are sure to please the men who know from experience—both your equipment superintendent and his assistants—

The difference between an uncertain, short-life article and a consistent, long-life article.

*There is Saving as Well as Safety
in Boyerized Products.*

Bemis Car Truck Co., Springfield, Mass.

TAYLOR MAXIMUM TRACTION TRUCK



12 FACTS REGARDING "TAYLOR-MADE" TRUCKS

- ABSOLUTELY SAFE
- RIDE LIKE PULLMANS
- SIMPLE IN CONSTRUCTION
- REDUCE WEAR OF MOTORS
- WILL INCREASE DIVIDENDS
- REDUCE COST OF MAINTENANCE

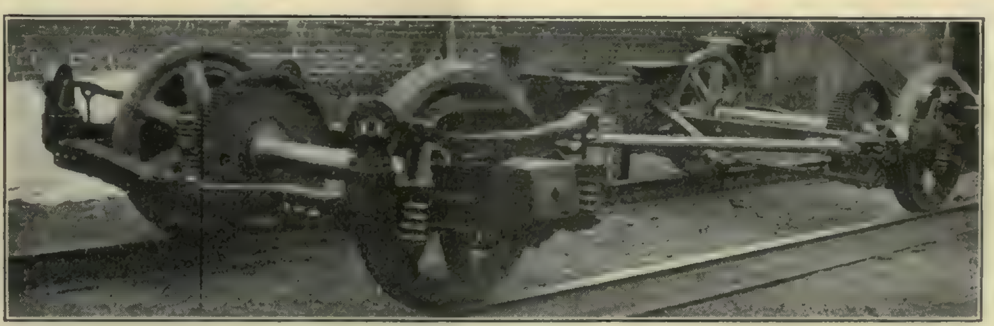
- SAVE POWER
- SAVE ROAD BED
- LIGHT IN WEIGHT
- OVERCOME FLANGE WEAR
- BRAKES DO NOT CHATTER
- PREVENT SIDE OSCILLATION OF CARS

TAYLOR ELECTRIC TRUCK CO , TROY, N. Y.

Established 1892

SPECIFICATIONS ON REQUEST

SEND FOR PORT-FOLIO



Built for the Fishkill Electric Railway Company

Philadelphia Radial Trucks

Save Many Dollars In Weight, Power and Maintenance Cost

The use of Philadelphia radial trucks does more than permit a wider range of economical service than the rigid single truck or the usual double truck car.

The use of Philadelphia radial trucks means a saving of thousands of pounds in truck and brake rigging metal—a saving, too, that means more than ever today.

This reduction in weight means a corresponding saving in power for propulsion—

While the reduction in parts means a corresponding saving in maintenance.

Philadelphia Radial Trucks Are Proving These Assertions In Everyday Service

NO NOSING NO GALLOPING ANY WHEEL BASE REQUIRED

Philadelphia Holding Company, 505 Chestnut St., Philadelphia

The demand for our material is so great that we earnestly recommend our customers to anticipate their needs as much as possible.

STANDARD STEEL WORKS CO.

Morris Building Philadelphia

New York	Portland
Chicago	Havana, Cuba
St. Louis	London, Eng.
Pittsburgh	Melbourne, Aust.
San Francisco	Monterey, Mex.
Richmond	Mexico City

To meet the requirements of its high class service—

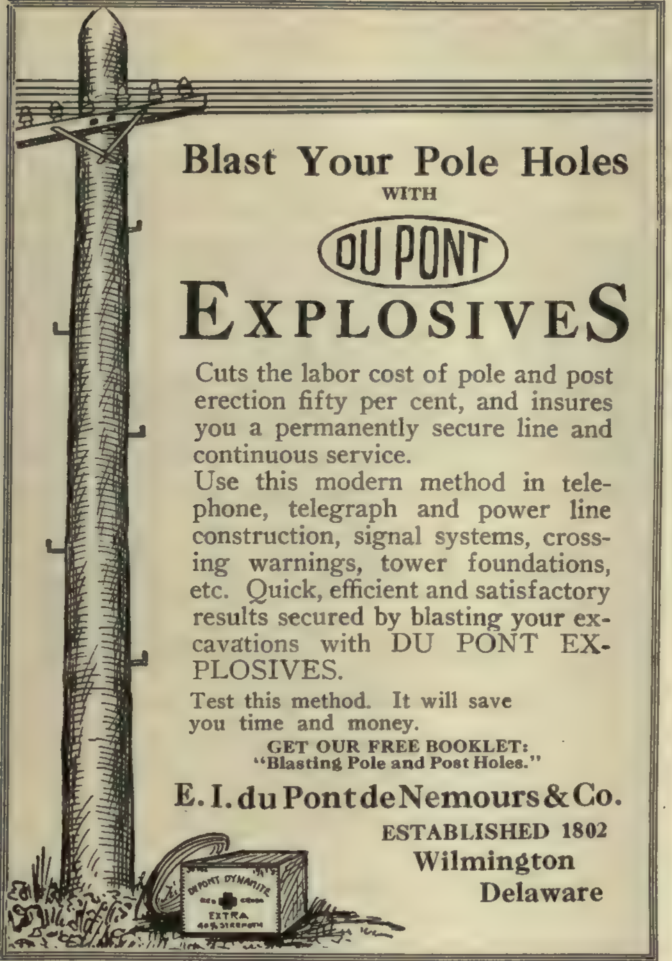
The London & Port Stanley Railway

ordered

Jewett Steel Cars

one of which is shown above.
They are decidedly "cars of character."
Let us figure on *your* new requirement.

THE JEWETT CAR CO., Newark, Ohio



Blast Your Pole Holes
WITH
DU PONT
EXPLOSIVES

Cuts the labor cost of pole and post erection fifty per cent, and insures you a permanently secure line and continuous service.

Use this modern method in telephone, telegraph and power line construction, signal systems, crossing warnings, tower foundations, etc. Quick, efficient and satisfactory results secured by blasting your excavations with DU PONT EXPLOSIVES.

Test this method. It will save you time and money.

GET OUR FREE BOOKLET:
"Blasting Pole and Post Holes."

E. I. du Pont de Nemours & Co.
ESTABLISHED 1802
Wilmington
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STEEL POLES For every pole purpose

Bates Steel Poles in use by the DES MOINES CITY RAILWAY, Des Moines, Iowa, U. S. A.

Strongest STEEL POLE of like weight in the world.
Best STEEL POLE in the world for electric railway trolley service.
Most artistic STEEL POLE in the world for any service.
We make the lowest prices.
We have constantly on hand about two thousand tons of steel and can make immediate shipments.
A full line of convenient malleable fittings.
Our steel pole TREATISE tells a big story, ask for it.

BATES EXPANDED STEEL TRUSS CO.
208 South La Salle St., Chicago, Ill., U. S. A.

FREE

—a handbook on economical connections—and a sample Frankel Solderless Connector.

MAKERS OF THE BEST ONLY
FRANKEL
CONNECTOR CO. INC. N.Y.

Factory:
177-179 Hudson St.,
New York
Sales Rooms:
733-735 Broadway

The man on your road responsible for economical and proper electrical connections will appreciate the story that this book and sample connector will tell.

Both represent new ideas—both point the way to better splices.

You incur no obligation in writing for them. Do it now.

Permanent Overhead Construction

If you find it necessary to rebuild your interurban overhead construction on account of the decay of your wooden poles, write us and we will give you an estimate as to what permanent reconstruction would cost you.

Archbold-Brady Company
Engineers and Contractors
Syracuse, N. Y.

THE LINDSLEY BROTHERS CO.

Western **"Good Poles Quick"** Northern

Quick Shipments from our Minneapolis Yard

Rooms 832-834, 72 West Adams St., Chicago, Ill.
Spokane - St. Louis

Butt Treating
Open Tank and
"Hot and Cold" Processes

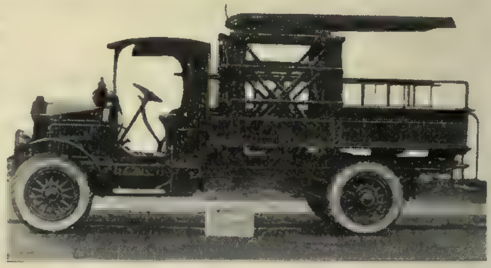
TREATED

POLES, CROSS ARMS, TIES, TIMBERS, PAVING BLOCKS.
CAPACITY 100,000,000 FEET B. M PER ANNUM
SEND FOR PAMPHLET
INTERNATIONAL CREOSOTING & CONSTRUCTION CO.
Address all communications to Office, Galveston, Texas
Works: Beaumont, Texas Texarkana, Texas

The Trenton THREE SECTION TOWER

outfits for any make of chassis. Make a low, well-balanced outfit on the road with maximum elevation in use

Send postal for literature and prices.



J. R. McCARDELL & CO., Trenton, N. J.
Patentees and Sole Manufacturers

ALUMINUM

Railway Feeders

And all kinds of **Electrical Conductors**

Aluminum feeders are less than one-half the weight of copper feeders and are of equal conductivity and strength. If insulated wire or cable is required, high-grade insulation is guaranteed. Write for prices and full information.

Aluminum Company of America
Pittsburgh, Pa.

Wire Rope and Wire
Insulated
WIRES and CABLES

JOHN A. ROEBLING'S SONS COMPANY, Trenton, N. J.

"NATIONAL" Tubular Steel Poles
for Telegraph, Telephone, Electric Light and Electric Railway Construction. Write for literature
National Tube Co. PITTSBURGH, PA.

The Simmen System
DISPATCHER MOTORMAN
Direct Contact Between
Dispatcher and Motorman
Write for Details
SIMMEN AUTOMATIC RAILWAY SIGNAL CO.
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We brag about the SERVICE we give

B. J. CARNEY & CO.

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Spokane, Wash.

WM. MULLER & CO., 1729 McCormick Bldg., Chicago.
Commit us to memory.

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CONSULT OUR ENGINEERS ON YOUR SIGNAL REQUIREMENTS
52 Vanderbilt Avenue, New York Monadnock Block, Chicago
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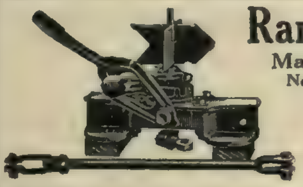

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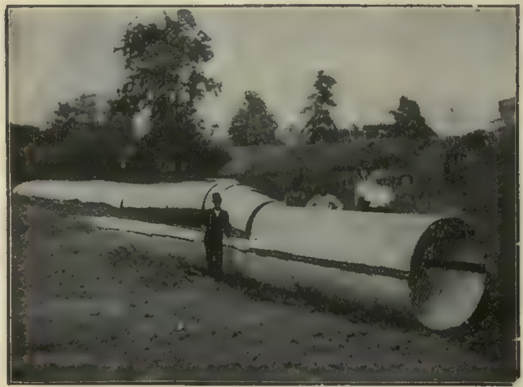

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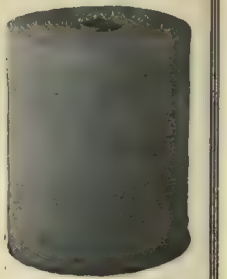

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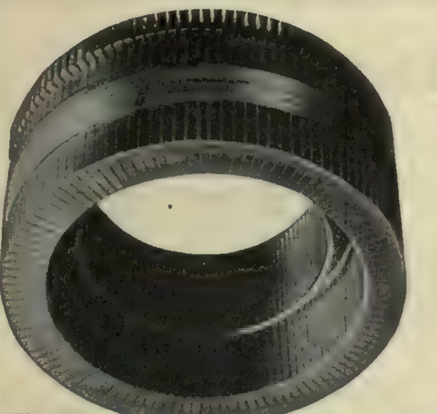

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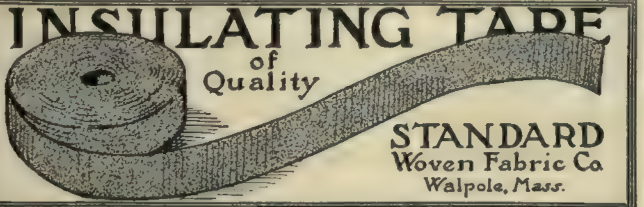

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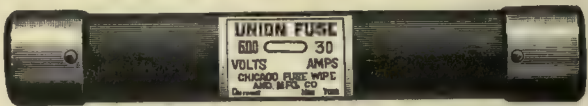

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operates directly from the line and always gets plenty of juice. No metal is exposed to the passenger's touch.

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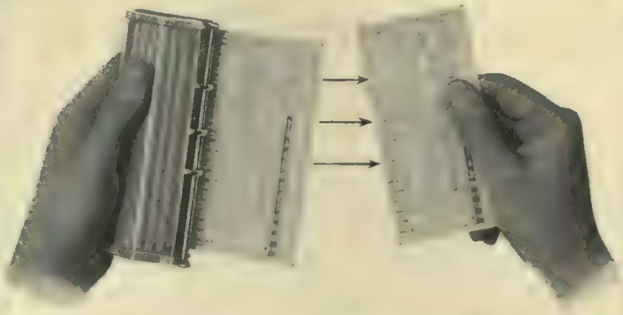

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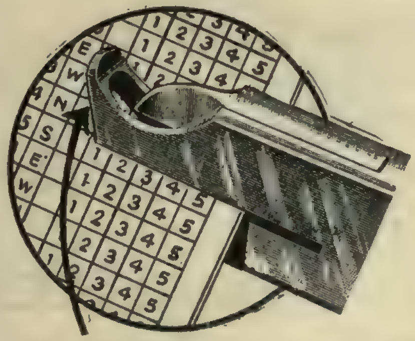

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BONNEY-VEHSLAGE VISIBLE PUNCH

That's what makes them so popular with your conductors.

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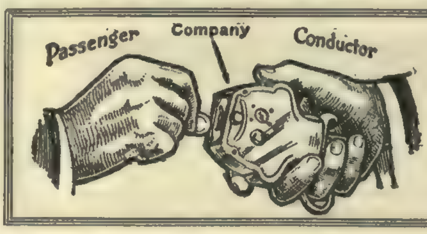

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for Monitor and Arch Roof Cars, and all classes of buildings; also
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Scrap sold will pay for the machines.

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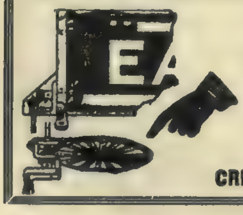

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By means of it, conductor or motorman can change sign without leaving platform. All that has to be done is to turn the crank. Better investigate.

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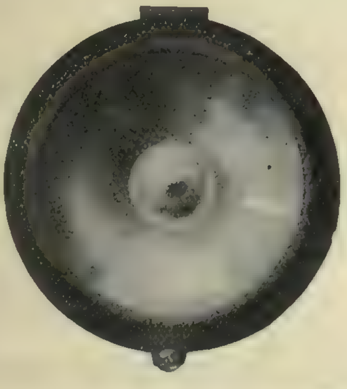

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It's the LIGHTEST, BRIGHTEST, TIGHTEST headlight on the market and it doesn't cost any more than the others.

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Above products are used on all leading railways. For details address
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Miles of service from the Brake Shoe are more to be desired than pounds of scrap.

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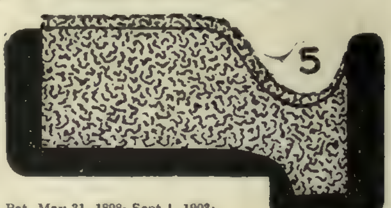

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THE AJAX METAL COMPANY
Established 1880
Main Office & Works: Philadelphia, Pa. Southern Plant, Birmingham, Ala.
New York Pittsburgh Chicago San Francisco
Boston Washington St. Louis Detroit

Steel for Service

More than fifty years ago the

Axles

made by this company were a standard of excellence.

They have always retained that distinction.

Carnegie Steel Company
General Offices, Pittsburgh, Pa.

855

TULC

We base all our "ads" on facts. We guarantee TULC and stand back of it. Others have shown a large saving with TULC. It has been proven to be the best lubricant.

THE UNIVERSAL LUBRICATING CO.
Schofield Building CLEVELAND, O.

Are you interested in an

All-Steel
Double Truck
Car

seating 46 people
and weighing
complete 26,000 pounds?

If you are,
write us
"The Quality Shops"

St. Louis
Car Company

15%
Energy Reduction
Is but One Saving

Rollway Bearings accomplish. Not only do they eliminate friction in truck bearings to permit more coasting, but they save enough on lubrication and carhouse labor to make the change a good investment.

Write for the facts to

The Railway
Roller Bearing Co.
Syracuse, N. Y.

AMERICAN CARBON AND GRAPHITE MOTOR AND GENERATOR BRUSHES are made in all sizes and shapes, with or without pigtails, and in grades suitable for all classes of Motor and Generator service.

AMERICAN CARBON & BATTERY CO. EAST ST. LOUIS, ILL.

UNION SPRING & MFG. CO.
SPRINGS
COIL AND ELLIPTIC
M. C. B. Pressed Steel Journal Box Lids
General Office: First Nat'l Bank Bldg.
PITTSBURGH, PA.
Works: New Kensington, Pa.
50 Church St., New York. 1204 Fisher Bldg., Chicago, Ill.
Missouri Trust Bldg., St. Louis, Mo.

The "Hycap-Exide" Battery
for
STORAGE BATTERY STREET CARS
THE ELECTRIC STORAGE BATTERY CO
PHILADELPHIA

VAN DORN COUPLERS

are made for every condition and requirement. M. C. B. Pin and Link, Car and Air, in all sizes and types.

VAN DORN COUPLER CO.
2325 So. Pauling St., Chicago, Ill.

HORNE RAILWAY DEVICES

Horne Double Acting Brakes
Giant Geared Brakes
Differential Staffless Brakes
Sterling Safety Brakes
Sterling Trolley Bases
Sterling Sand Boxes
Air Rectifiers, eliminating frozen air brake piping
Q-P Trolley Catchers
Lord Screenless Air Cleaners for Compressors
Hydrogrounds and Lightning Arresters
Fenders and Wheelguards
Controller Fingers
Friction and Rubber Tape
Packing and Gaskets
Air Hose and Rubber Specialties

HORNE MANUFACTURING CO., 50 Court St., Brooklyn, N. Y.

SEARCHLIGHT SECTION

FOR SALE

CARS

5—15 bench open cars with motors, trucks and air-brake equipment.
4—13 bench open cars with motors, trucks and air-brake equipment.
12—10 bench open cars with single trucks and motors.
4—20 ft. closed cars with single trucks and motors.

MOTORS

8—Brand new G.E. 201-H, 65 H.P. railway motors complete.
10—Brand new West. 306, 50 H.P. railway motors.
8—Brand new West. 317-A, 90 H.P. railway motors complete.

AIR COMPRESSORS

35—Second hand AA 1 air compressors.

CONTROLLERS

2—Brand new K-12 controllers.
12—K-6 controllers.

CABLE

10 miles S.H. 500,000 C.M. T.B. weather-proof concentric laid copper cable, weighing approximately 10,000 pounds to the mile.

For further particulars apply to

W. R. KERSCHNER COMPANY, INC.
50 Church Street, New York, N. Y.

STREET CAR MOTORS AND CONTROLLERS

MOTORS
10 Westinghouse No. 306. PRACTICALLY NEW—LESS THAN ONE YEAR IN SERVICE.
12 Westinghouse No. 317-A, with gears and pinions. ABSOLUTELY NEW.

CONTROLLERS
38 Gen. Elec. K-10 with handles and brackets.

RECIPROCATING UNITS—25 Cycle
1 1200 KW. Gen. Elec., 3 phase, 25 cycle, 6600 volts, 75 RPM., dir. conn. to 30" & 50" x 60" Allis cross compd. engine.
1 500 KW. Westg.
2 500 KW. Westg., 3 phase, 25 cycle, 390 volts, 215 RPM., dir. conn. to 22" & 36" x 21" Westg. steeple engines.
1 400 Kva. Crocker Wheeler, 3 phase, 25 cycle, dir. conn. to 24" x 36" Erie City side crank engine.

RECIPROCATING UNITS—550 Volt Direct Current
1 800 KW. Gen. Elec., 550 volt, 10 pole, dir. conn. to 36" x 48" E.P. Allis horiz. heavy duty engine, 100 RPM.
2 500 KW. Gen. Elec., 540-600 volt, 10 pole, dir. conn. to 32" x 48" Greene engines.

ROTARY CONVERTERS & MOTOR GENERATOR SETS, 25 Cycles
1 600 KW. Gen. Elec., TC-A, 3 ph., 600 volt D.C., 375 volt A.C., 8 pole, 375 RPM.
1 600 KW. set consisting of two 300 KW. 6 pole generators, 550 volts, 600 amps., dir. conn. to one 750 HP. synchronous motor, 3 ph., 25 cy., 6600 volt, 500 RPM., complete with AC and DC panels.
4 500 KW. Gen. Elec., HC-K, 600 volt D.C., 4 pole, 750 RPM., each rotary complete with three 165 Kva. Gen. Elec. OI SC Transformers, HP-RP, 6600/5940 volts prim., 430/286/143 volts sec., also necessary panels and instruments.
1 500 KW. Westg., 3 ph., 550 volt D.C., 390 volt A.C., 6 pole, 500 RPM., with dir. conn. starting motor, AC and DC panels and three 175 KW. Westg. oil cooled transformers, 13200 volts prim., 390 volts sec.

Our new and complete list of steam and electrical equipment will be mailed upon request

MACGOVERN & COMPANY, Inc.
114 Liberty Street, New York City

IMMEDIATE SHIPMENT

Turbines

1—1250 KVA. Westinghouse Horizontal Turbo Generating Units, wound for 3 phase, 60 cycles, 2200 volts. Each unit complete with 4500 sq. ft. Worthington surface condenser, circulating pump, rotary dry vacuum pump and wet vacuum pump. Designed for 150 lb. steam pressure. Turbines fitted with bronze blading.

25 Cycle Rotary Converters

2—150 KW. General Electric type T.C., 4-150-750, 25 cycle, 3 ph., 575 volt, rotary converters, 750 rpm., complete with end play and speed limit device.

200 Kilowatt 60 Cycle Rotary Converters

2—200 KW. Westinghouse 3 ph., 60 cy. rotary converters, 550 volts, 720 rpm., complete with 4—100 KW. Westinghouse Scott connected oil insulated transformers, 10,000/9500 volts prim., 430/362 volts secy.

Transformers

6—750 KVA. General Electric oil filled self cooled transformers, 4400/281 volts, with 4400-4290-4180-4070-2200-2090-1980 taps in the primary.
3—500 KW. General Electric, 60 cy., single phase transformers, 66,000 volts primary, 4400/2200 volts secondary.
3—350 KVA. General Electric, type H, 60 cy., transformers 2400/2300/2200 v. prim., 200/400 v. secy.
1—100 KVA. General Electric, type H, 60 cy. transformer, 4600 volts prim., 115-230 volts secy.
3—100 KW. Wagner single phase, 60 cycle, 6600 volts primary, 2050/2300 volts secy., complete with oil.
4—100 KW. Westinghouse, oil insulated, Scott connected transformers, 10,000/9500 v. primary, 430/362 v. secondary.
3—75 KW. Westinghouse 60 cy. transformers, 2200 v. prim., 110/220/440 v. secy.
3—50 KVA. General Electric type H, 60 cy. transformers, 900/1000/16000 v. prim. Y., 230/460 v. secy.
Also a stock of smaller sized transformers.

IMMEDIATE DELIVERY

ARCHER & BALDWIN
114-118 Liberty Street New York City
TELEPHONE 4337-4338 RECTOR

CARS FOR SALE

OPEN and CLOSED
MOTOR and TRAIL

Write for Price and Full Particulars to

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg. Philadelphia, Pa.

It Would Be Almost a Miracle

if one or more of the 8,000 men who regularly receive the JOURNAL did not happen to want that used machine which you want to sell. The

Searchlight Section

brings buyers and sellers together

Copy received until Wednesday noon for publication in the issue of that week

SEARCHLIGHT SECTION

Get your Wants into the Searchlight

ADVERTISING RATES

Under "Positions Wanted," including Salesmen looking for new connections, Evening Work Wanted, etc., undisplayed advertisements cost **three cents a word,** minimum charge 50 cents an insertion, **payable in advance**; less 10% if one payment is made in advance for 4 continuous insertions.

Under "Positions Vacant," including Agents and Agencies Wanted, Representatives Wanted, Salesmen Wanted, Partners Wanted, Business Opportunities, Employment Agencies, and Miscellaneous For Sale, For Rent, and Want ads; also Auction Notices, Receivers' Sales, Machinery and Plants For Sale or Wanted, undisplayed advertisements set solid in one paragraph, cost **five cents a word,** minimum charge $1.50 an insertion.

Machinery advertisements (undisplayed) set with a paragraph for each item, or tabulated, 30 cents a line, minimum 5 lines.

If replies are in care of any of our offices, allow five words for the address.

All advertisements for bids (Proposals) cost $2.40 an inch.

ADVERTISEMENTS IN DISPLAY TYPE

cost as follows for single insertions:

$\frac{1}{16}$ p. (1⅛x3⅜ ins.)	$5.00	1 in. (1x$2\frac{3}{16}$ ins.)	$3.00
⅛ p. (2⅜x3⅜ ins.)	10.00	4 inches (4x$2\frac{3}{16}$ ins.)	11.60
¼ p. (5x3⅜ or 2⅜x7 ins.)	20.00	8 inches (8x$2\frac{3}{16}$ ins.)	22.40
½ p. (10¼x3⅜ or 5x7 ins.)	40.00	15 inches	40.50

For space to be used within one year, to be divided to suit requirements of advertiser, provided some space is used at least once a month following first insertion:

1 page	$80 a page	18 pages	$56 a page
3 pages	72 a page	26 pages	52 a page
6 pages	64 a page	32 pages	50 a page
9 pages	62 a page	40 pages	48 a page
12 pages	58 a page	52 pages	45 a page

In replying to advertisements, do NOT enclose original testimonials, or anything that you may want returned.
State your qualifications in as concise and neat a manner as you can and enclose COPIES of testimonials.
In machinery ads, use a local name or address if possible so that readers can wire direct and get quick replies.

FOR SALE

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.

We positively own these Rails and offer same in carload lots and over.

25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.

Immediate shipment guaranteed and prices very attractive.

Carload and less than carload inquiries and orders solicited.

Rails cut to length for structural purposes.

Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Bldg Pittsburgh, Pa.

CLEVELAND ARMATURE WORKS

Cleveland, Ohio

Everything in the Line of Repairs to Electrical Machinery

Complete Armatures, New Armatures, Rewound Armature Cores, Armature Shafts, Armature Coils, Fields and Commutators.

Established 22 Years.

Armature Coil Taping Machine

Saves Time, Labor and Money

A boy can tape 40 coils for Westinghouse 12A Armature in an hour. Further particulars gladly furnished.

Geo. M. Griswold Machine Co.
New Haven, Conn.

FOR SALE

Immediate Shipment

100 tons of 62 lb. Shanghai rails, together with bars, rails practically as good as new, ready for quick shipment. Wire for prices.

M. K. FRANK
Frick Building, Pittsburgh, Pa.

NEW STEEL RAILS
For Immediate Shipment
225 tons 75 lb. with Heavy Splices
280 tons 85 lb. with Angles
1000 tons 90 lb. with Angles

Exceptional opportunity. Also large quantity other Section. *Write* or *Wire.*

ZELNICKER IN ST. LOUIS

FOR SALE

Two second-hand

Car Wheel Boring Mills

In good condition.

Apply to The Baltimore Car Wheel Co., Baltimore, Md.

MISCELLANEOUS WANTS

Wanted at Once

For immediate shipment any quantity of battery lead plates, sediment scrap copper and wire, brass and all other grades of scrap material. Write to us today for our prices. National Metal & Rubber Co., 31 India Wharf, Boston, Mass.

POSITIONS WANTED

ENGINEER executive desires position as manager of public utility. Technical graduate, 15 years' experience; engineering, operating and executive positions. Good record and references. P. W. 1436, (Ill.) Elec. Ry. Jour., Chicago.

POSITIONS WANTED

FOREMAN of equipment, long experience, both city and interurban, open for engagement. P. W., 1519 (N. Y.), Elec. Ry. Journal, N. Y. C.

HAVE had twelve years' experience in operating and traffic department of important electric railway systems. Am now superintendent of one. Best of references by present and past employers. Capable filling manager's position. P. W., 1513, (Ohio) Elec. Ry. Journal, Chicago.

SUPERINTENDENT, good experience and record on city and suburban property. Available now. Good references. P. W. 1505 (Ill.) Elec. Ry. Journal, Chicago.

POSITIONS VACANT

DRAFTSMAN experienced in railway maintenance of way work and general designing. Apply Engineer, Maintenance of Way, N. O. T. & L. Co., Akron, Ohio.

EXPERT armature winder and electrician who is familiar with general maintenance and capable of taking charge of rolling stock of small road wanted. Give experience, references, salary, date can report, photo, and all other needed information in first letter. Address P. 1517 (Ill.), Elec. Ry. Journal, Chicago.

REPAIRMAN wanted on Westinghouse HL Air Control, one capable of re-wiring cars. A man with knowledge of automatic air preferred. Give age, references and salary in first letter. Location Illinois. Good working conditions. P. 1518 (Ill.), Elec. Ry. Journal, Chicago.

EMPLOYMENT AGENCIES

Correspondence Service

The undersigned provides a confidential service designed to locate openings through correspondence for men earning not less than $2,500 and up to $25,000; all lines. Not an employment agency, but a constructive, initiative service, covering individual negotiations. Established 1910. Complete privacy assured; present connections in no way jeopardized. Send name and address only for explanatory details. R. W. Bixby, H1 Niagara Square, Buffalo, N. Y.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

More than 300 different products are here listed. The Alphabetical Index (see eighth page following) gives the page number of each advertisement.

As far as possible advertisements are so arranged that those relating to the same kind of equipment or apparatus will be found together.

This ready-reference index is up to date, changes being made each week.

If you don't find listed in these pages any product of which you desire the name of the maker, write or wire Electric Railway Journal, and we will promptly furnish the information.

Acetylene Apparatus. (See Cutting Apparatus, Oxy-Acetylene.)

Acetylene Service.
Oxweld Acetylene Co.

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Horne Mfg. Co.

Alloys, Steel & Iron.
Titanium Alloy Mfg. Co.

Alloys, and Bearing Metals. (See Bearings and Bearing Metals.)

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Automobiles and Buses.
Brill Co., The J. G.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
National Railway Appliance Co.
National Tube Co.
St. Louis Car Co.
Standard Steel Works Co.
Taylor Electric Truck Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
American Railway Supply Co.
Electric Service Supplies Co.
International Register Co.
Woodman Mfg. & Supply Co., R.

Bankers and Brokers.
Coal & Iron National Bank.
National City Co.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
St. Louis Car Co.
Taylor Elec. Truck Co.
Westinghouse Elec. & M. Co.

Bearings, Center.
Baldwin Locomotive Works.
Holden & White, Inc.

Bearings, Oil-less, Graphite, Bronze and Wood.
Bound Brook Oil-less Bearing Co.

Bearings, Roller and Ball.
Gurney Ball Bearing Co.
Railway Roller Bearing Co.

Bearings, Roller Side.
Holden & White, Inc.
Stucki Co., A.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Watson-Stillman Co.
Zelnicker Supply Co., W. A.

Blasting Powder & Equipment.
Du Pont de Nemours & Co., E. I.

Blow Torches for Soldering and Brazing. (See Cutting Apparatus, Oxy-Acetylene.)

Blowers.
General Electric Co.
Westinghouse Elec. & M. Co.

Boiler Cleaning Compounds.
Dearborn Chemical Co.

Boiler Graphite.
Dixon Crucible Co., Joseph.

Boiler Tubes.
National Tube Co.

Boilers.
Babcock & Wilcox Co.

Bond Clips.
Electric Railway Improve. Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improve. Co.
Ohio Brass Co.
Oxweld Acetylene Co.

Bonding Tools.
American Steel & Wire Co.
Electric Railway Improve Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improve. Co.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Bonds, Welded.
Lincoln Bonding Co.

Book Publishers.
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Piling and Lumber.)
Bates Expanded Steel Truss Co.
Creaghead Engrg. Co.
Electric Ry. Equipment Co.
Electric Service Supplies Co.
Hubbard & Co
International Creo. & C. Co.
Lindsley Bros. Co.
Ohio Brass Co.
Union Electric Co.

Brake Adjusters.
Holden & White, Inc.
Smith-Ward Brake Co.

Brake Shoes.
American Brake S. & Fdy. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Long Co., E. G.
St. Louis Car Co
Taylor Elec. Truck Co.
Wheel Truing Brakeshoe Co.

Brakes, Brake Systems and Brake Parts.
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
Long Co., E. G.
National Brake Co.
St. Louis Car Co.
Safety Car Devices Co.
Taylor Elec. Truck Co.
Westinghouse Trac. Brake Co.

Brazing. (See Welding.)

Brooms, Track, Steel or Rattan.
Zelnicker Supply Co., W. A.

Brushes, Carbon.
American Carbon & Battery Co.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
Dixon Crucible Co., Jos.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Eureka Co.

Bumpers, Car Seat.
Electric Service Supplies Co.

Bushings, Case Hardened Manganese.
Bemis Car Truck Co.

Bushings, Fibre.
Diamond State Fibre Co.

Bushings, Graphite & Wooden.
Bound Brook Oil-less Bearing Co.

Buttons. (See Badges and Buttons.)

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc., see those Headings.)

Car Stop, Automatic.
Consolidated Car-Heating Co.

Car Trimmings. (For Curtains, Doors, Seats, etc., see those Headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Jewett Car Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Stephenson Co., John.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co
Kerschner Co., Inc., W. R.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Castings, Brass.
Columbia M. W. & M. I. Co.
Eureka Co.
Frankel Connector Co.

Castings, Composition or Copper.
Anderson M. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.

Castings, Gray Iron and Steel.
American B. S. & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Standard Steel Works Co.
Union Electric Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
American Brake S. & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Earll, C. I.
Eclipse Railway Supply Co.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
Ohio Brass Co.
Trolley Supply Co.
Union Electric Co.
Wood Co., C. N.

Ceiling, Car.
Pantasote Co., The.

Chargers, Storage Battery.
General Electric Co.

Checks, Employees.
American Railway Supply Co.

Chemists.
Little, Inc., Arthur D.

Circuit Breakers.
Cutter Electrical & Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors, for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Dossert & Co.
Electric Service Supplies Co.
Frankel Connector Co.
General Electric Co.
Hubbard & Co.
Klein & Sons, M.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M Co.

Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.

Cleats, Car Wiring.
General Electric Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling. (See Conveying and Hoisting Machinery.)

Coil Banding and Winding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Coils, Armature and Field.
Cleveland Armature Works
Coil Mfg. & Repair Co.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
Electric Service Supplies Co.
International Register Co.
Johnson Fare Box Co.

Model 370—A.C. and D.C. Ammeter

One of the Portable Electrodynamometer Group, which also includes Model 310 Single Phase and D.C. Wattmeter, Model 329 Polyphase Wattmeter and Model 341 A.C. and D.C. Voltmeter.

The characteristics of the group are extreme accuracy (guaranteed within a fraction of 1% full scale value), adaptability for use on circuits of any commercial frequency and any wave form, great overload capacity, low moment of inertia, effective damping and shielding, and the legibility and remarkable uniformity of the hand calibrated scales.

Idealism That is Practical

To attain the highest possible standard of service is the dominating purpose which subordinates all other considerations in the designing and building of

Weston

Indicating Instruments

Especially in this field of Electrical Measurement, such an ideal is thoroughly consistent with practical commercial demands. So it is that Weston preeminence is as well recognized from the commercial standpoint as from the scientific.

Weston Indicating Instruments include a great variety of groups for portable or switchboard service on A. C. or D. C. Circuits, Instruments designed expressly for testing and laboratory use, for motor car and boat electrical systems, and many others for special purposes. Write for Bulletins or Catalogs describing those which interest you.

Weston Electrical Instrument Company
21 Weston Ave., Newark, N. J.

New York
Philadelphia
Pittsburgh
Cleveland
Cincinnati
Chicago
Boston
Buffalo
Richmond
San Francisco
Denver
Detroit
St. Louis
Toronto
Winnipeg
Montreal
Vancouver
London
Paris
Petrograd
Florence
Johannesburg, S. Africa

Standing the Overload

What's the usual result of an overload on your car motors or compressors?

A puff of smoke—followed by a trip to the repair shop. You can eliminate these trips by using

Salamander Fireproof Wire

motor field, armature and compressor coils. You can't burn out Salamander Wire Coils. We've had them red-hot on test without any breakdown.

Send for samples and catalogs.

Independent Lamp & Wire Co., Inc.
Offices: 1737 Broadway, New York
FACTORIES: York, Pa., and Weehawken, N. J.

National Railway Appliance Company

50 East 42d St., NEW YORK CITY
Chicago Washington, D. C.

RAILWAY SUPPLIES

SELLING AGENTS FOR

Tool Steel Gears and Pinions
Johnson Fare Box
Perry Side Bearings
Hartman Centering Center Plates
Wasson Trolley Bases
Garland Ventilator
Electric Arc Welders
High Class Railway Varnishes and Enamels
Elastic Car Waste

Special Agents for
- Tool Steel Gear & Pinion Co.
- Johnson Fare Box Co.
- C. & C. Electric & Mfg. Co.
- Holden & White

General Agents for Anglo-American Varnish Co.
Eastern Agents for Union Fibre Co.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Wood Co., C. N.

Commutator Truing Devices.
General Electric Co.

Commutators or Parts.
Cameron Elec'l Mfg. Co.
Cleveland Armature Works.
Coil Mfg. & Repair Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Long Co., E. G.
Mica Insulator Co.
Westinghouse Elec. & M. Co.

Compressors, Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Trac. Brake Co.

Condensers.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Conduits, Flexible.
Tubular Woven Fabric Co.

Conduits, Underground.
Standard Underground Cable Co.

Connectors, Solderless.
Dossert & Co.
Frankel Connector Co.
Horne Mfg. Co.

Controller Fingers.
Horne Mfg. Co.

Controller Regulators.
Electric Service Supplies Co.

Controllers or Parts.
Allis-Chalmers Mfg. Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Kerschner Co., Inc., W. R.
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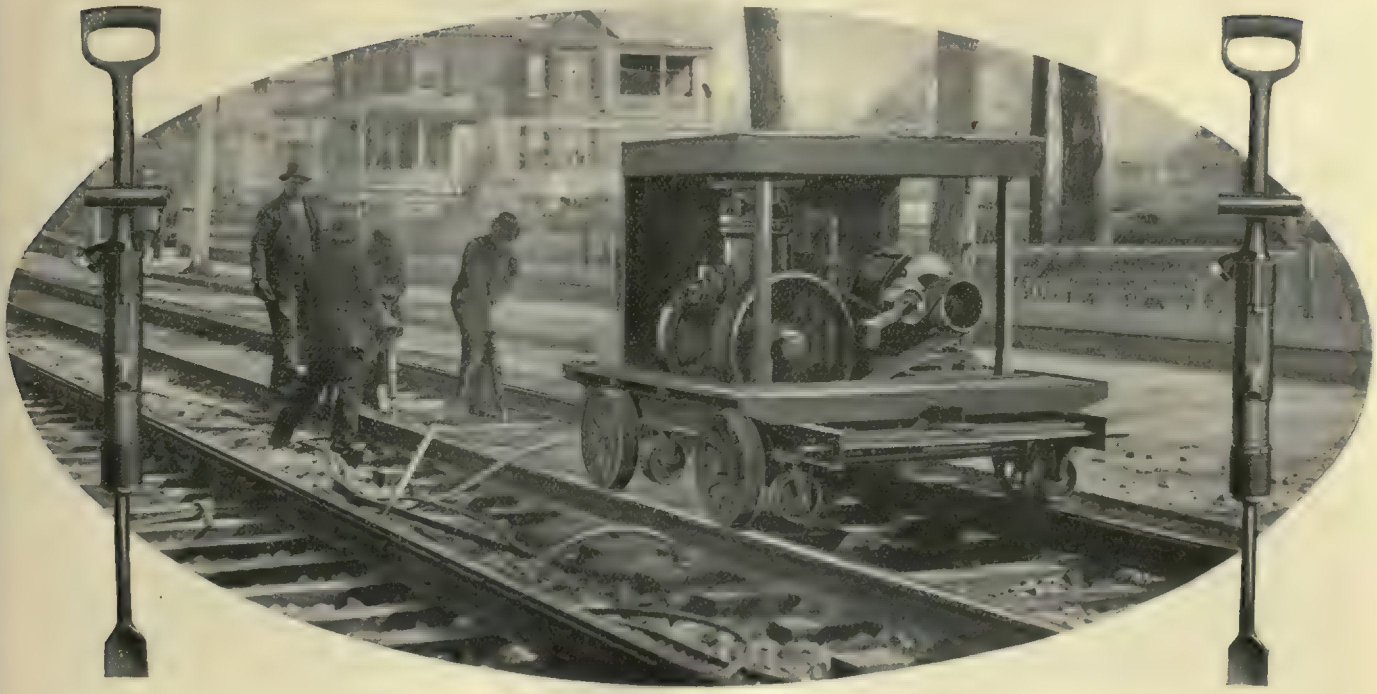

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In the matter of a filler for brick, granite or wood block—

—*If you use cement filler,* you must study the matter of expansion-joints and do some clever guessing, and as there is no exact science of expansion-joints, you are due to guess wrong once in a while. Then your pavement cracks from contraction or "explodes" from expansion, or thrusts the curb all awry, or breaks off the top of a manhole! You must also watch minutely the installation of the cement filler, for the omission of a little spot here and there means frost in your foundation.

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There will be no expansion-joints and no expansion problem—"*Every joint is an expansion-joint.*"

It maintains a tight, flexible seal through winter and summer, and when after twenty or thirty years the bricks wear out the pitch will still be there and as good as new, unaffected physically or chemically by its long service.

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Towers & Transmission Structures.
Archbold-Brady Co.
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Tower Wagons & Auto-Trucks
McCardell & Co., J. R.

Track, Special Work.
American Frog & Switch Co.
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Columbia M. W. & M. I. Co.
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Ramapo Iron Works.

Transfers. (See Tickets.)

Transfer Issuing Machines.
Ohmer Fare Register Co.

Transfer Tables.
Archbold-Brady Co.

Transformers.
Allis-Chalmers Mfg. Co.
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Trap Doors.
Edwards Co., Inc., The O. M.

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American Mason Safety T. Co.
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Anderson M. Co., A. & J. M.
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Trolleys and Trolley Systems.
Ford Chain Block & Mfg Co.

Trucks, Car.
Baldwin Locomotive Works.
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Brill Co., The J. G.
Globe Ventilator Co.
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Vestibules, Portable.
Brill Co., The J. G.

Volt Meter. (See Instruments.)

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Anderson M. Co., A. & J. M.
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Electric Service Supplies Co.
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Winding Machines. (See Coil Banding and Winding Machines.)

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Roebling's Sons Co., John A.
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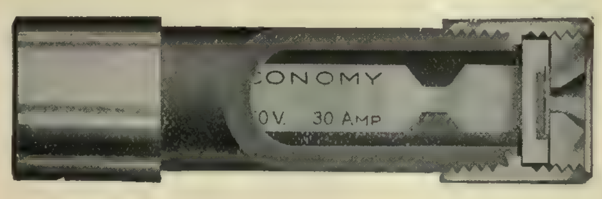

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A

Page
Ajax Metal Co. ... 76
Allis-Chalmers Mfg. Co. ... 56
Aluminum Co. of America ... 66
Amer. Brake Shoe & Fdry. Co. ... 76
American Car Co. ... 91
American Carbon & Battery Co. 77
American Electrical Works ... 51
American Frog & Switch Co. ... 68
American Mason S. T. Co. ... 75
American Ry. Supply Co. ... 74
American Steel & Wire Co. ... 68
Anchor Webbing Co. ... 69
Anderson Mfg. Co., A. & J. M. ... 53
Archbold-Brady Co. ... 65
Archer & Baldwin, Inc. ... 78
Arnold Co., The ... 42
Arthur Power-Saving Recorder Co. ... 28, 29

B

Babcock & Wilcox Co. ... 68
Baldwin Locomotive Works, The 50
Barrett Company, The ... 85
Bates Expanded Steel Truss Co. 65
Bemis Car Truck Co. ... 62
Bonham Recorder Co. ... 73
Bonney-Vehslage Tool Co. ... 73
Borne, Scrymser Co. ... 69
Bound Brook Oil-less Bear. Co. 33
Bridgeport Brass Co. ... 10
Brill Co., The J. G. ... 91
Buckeye Jack Mfg. Co. ... 71
Byllesby & Co., H. M. ... 42

C

Cameron Electrical Mfg. Co. ... 71
Canton Culvert & Silo Co. ... 68
Carnegie Steel Co. ... 76
Carney & Co., B. J. ... 66
Chicago Fuse Mfg. Co. ... 72
Chipman Chem. Engr. Co. ... 54
Cleveland Armature Works ... 79
Cleveland Fare Box Co. ... 73
Cleveland Frog & Crossing Co. 67
Coal & Iron National Bank ... 74
Coil Mfg. & Repair Co. ... 71
Collier, Inc., Barron G. ... 26
Columbia M. W. & M. I. Co. ... 45
Consolidated Car Fender Co. ... 72
Consolidated Car-Heating Co. ... 72
Cooper Heater Co., The ... 72
Creaghead Engineering Co. ... 74
Cutter Co., The ... 69

D

D & W Fuse Co. ... 25
Daum, A. F. ... 71
Dayton Fare Recorder Co., The. 48
Dearborn Chemical Co. ... 69
Diamond State Fibre Co. ... 67
*Dick, Kerr & Co., Ltd. ... A
Dixon Crucible Co., Joseph ... 57
Dossert & Co. ... 54
Drew Elec. & Mfg. Co. ... 14
Drum & Co., A. L. ... 42
Duff Manufacturing Co., The ... 71
Du Pont Fabrikoid Co. ... 59
Du Pont de Nemours & Co., E. I. ... 65

E

Earll, C. I. ... 60
Eclipse Ry. Supply Co. ... 73
Economy Fuse & Mfg. Co. ... 87

Page
Edwards Co., Inc., The O. M. ... 59
Electric Equipment Co. ... 78
Electric Railway Equipment Co. 16
Electric Railway Improve. Co. ... 23
Electric Railway Journal ... 30
Electric Service Supplies Co. ... 11
Electric Storage Battery Co. ... 77
Elec'l Testing Laboratories ... 42
Eureka Co. ... 75

F

Federal Signal Co. ... 66
Ford, Bacon & Davis ... 42
Ford Chain Block & Mfg. Co. ... 58
"For Sale" Ads ... 78, 79
Frankel Connector Co. ... 65

G

Galena-Signal Oil Co. ... 44
General Electric Co. .34, Back Cover
Globe Ventilator Co. ... 75
Gold Car Heating & Lighting Co. 74
Goldschmidt Thermit Co. ... 20
Green Eng'g Co. ... 70
Griswold Machine Co., G. M. ... 79
Gurney Ball Bearing Co. ... 90

H

Hale & Kilburn Co. ... 74
Hartshorn Co., Stewart ... 72
"Help Wanted" Ads ... 79
Holden & White, Inc. ... 12
Hope Webbing Co. ... 71
Horne Mfg. Co. ... 77
Hubbard & Co. ... 66
Hunt & Co., Robert W. ... 42

I

Independent Lamp & Wire Co. ... 81
Ingersoll-Rand Co. ... 83
International Creo. & Con. Co. ... 66
International Register Co., The. 47
International Steel Tie Co., The. 7

J

Jackson, D. C. & Wm. B. ... 42
Jeandron, W. J. ... 62
Jewett Car Co. ... 64
Johnson Fare Box Co. ... 49

K

Kerite Ins. Wire & Cable Co. ... 67
Kerschner Co., Inc., W. R. ... 78
Kilby Frog & Switch Co. ... 68
Kinnear Mfg. Co. ... 70
Klein & Sons, Mathias ... 66
Kuhlman Car Co., G. C. ... 91

L

Page
Lackawanna Steel Co. ... 21
Lincoln Bonding Co. ... 55
Lindsley Bros. Co. ... 66
Little, Inc., Arthur D. ... 42
Long Co., E. G. ... 76

M

Macallen Co. ... 53
McCardell & Co., J. R. ... 66
Macdonald Ticket & Ticket Box Co. ... 73
McGraw-Hill Book Co., Inc. ... 43
MacGovern & Co., Inc. ... 78
Mechanical Rubber Co. ... 56
Mica Insulator Co. ... 72
Morgan Crucible Co. ... 87
Murphy Iron Works ... 70

N

Nachod Signal Co., Inc. ... 67
National Brake Co. ... 41
National City Co. ... 42
National Railway Appliance Co. ... 81
National Tube Co. ... 66
Neiler, Rich & Co. ... 42
Nelsonville Brick Co. ... 68
New York Switch & Cross Co. ... 68
Niles-Bement-Pond Co. ... 69
Norton Co. ... 57
Nuttall Co., R. D. ... 60

O

Ohio Brass Co. ... 8, 9
Ohmer Fare Register Co. ... 46
Okonite Co. ... 51
Oxweld Acetylene Co. ... 31

P

Packard Electric Co. ... 70
Page Woven Wire Fence Co. ... 13
Pantasote Co., The ... Front Cover
Patten Co., Paul B. ... 74
Perey Mfg. Co., Inc. ... 74
Peters & Co., Ltd., G. D. ... 68
Philadelphia Holding Co. ... 63
"Positions Wanted" Ads ... 79
Power Specialty Co. ... 70
Protective Materials Corp. ... 22
Publishers Page ... 30

R

Railway Roller Bearing Co. ... 77
Railway Track-work Co. ... 24
Railway Utility Co. ... 73
Ramapo Iron Works ... 67
Republic Creosoting Co. ... 17
Richey, Albert S. ... 42
Roebling's Sons Co., John A. ... 66
Roller Lock Nut Co., Inc. ... 55
Rooke Automatic Register Co. ... 73

S

Page
St. Louis Car Company, The ... 77
Safety Car Devices Co. ... 5
Samson Cordage Works ... 74
Sanderson & Porter ... 42
Sangamo Electric Co. ... 72
Sargent & Lundy ... 42
Schofield Engineering Co. ... 42
Searchlight Section ... 78, 79
Second Hand Equip. ... 78, 79
Sherwin-Williams Co. ... 71
Simmen Automatic Railway Signal Co. ... 66
Smith Heater Co., Peter ... 72
Smith-Ward Brake Co. ... 61
Standard Paint Co. ... 70
Standard Steel Works Co. ... 64
Standard Underground Cable Co. 67
Standard Woven Fabric Co. ... 71
Star Brass Works ... 61
Stephenson Co., John ... 91
Stone & Webster Engrg. Corp. ... 42
Stucki Co., A. ... 75

T

Taylor Electric Truck Co. ... 63
Titanium Alloy Mfg. Co. ... 89
Trolley Supply Co. ... 75
Tubular Woven Fabric Co. ... 27

U

Union Electric Co. ... 75
Union Spring & Mfg. Co. ... 77
Union Switch & Signal Co. ... 18
U. S. Electric Signal Co. ... 19
Universal Lubricating Co., The. 76
Universal Safety Tread Co. ... 75

V

Van Dorn Coupler Co. ... 77

W

"Want" Ads ... 78, 79
Wason Mfg. Co. ... 91
Watson-Stillman Co. ... 58
Western Red Cedar Ass'n ... 15
Westinghouse Elec. & Mfg. Co. 2, 6
Westinghouse Traction Brake Co. 4
Weston Elec'l Instrument Co. ... 81
Wheel Truing Brake Shoe Co. ... 76
White Companies, The J. G. ... 42
White Elec'l Supply Co., T. C. ... 52
Wisch Service, The P. Edw. ... 86
Wood Co., Chas. N. ... 66
Woodman Mfg. & Supply Co., R. 73
Woodmansee & Davidson, Inc. 42

Y

Yale & Towne Mfg. Co. ... 52

Z

Zelnicker Supply Co., Walter A. 79

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CONTENTS

Steel Trolley Wire on Pacific Electric Railway

The present high price of copper, the electric railway's staff of life, makes this account by S. H. Anderson of timely interest. About 100 miles of steel wire have been put up by the Pacific Electric Railway since 1910 for both inland and coastwise lines of 600 or 1200 volts and direct or catenary suspension..........................Page 1038

New Source of Power for Public Service Railway

The Essex power plant of the Public Service Electric Company furnishes an excellent example of the latest steam power plant practice. In this article the routes of fuel, water, air and electricity through the plant are traced ....Page 1040

Up-State New York Lines Need Financial Relief

Commission data show that companies must curtail quantity and quality of service or secure higher rate of fare to avoid financial disaster. Thomas Conway, Jr., Ph.D., analyzes the difficulties under which the companies are operating ....Page 1045

EQUIPMENT AND ITS MAINTENANCE.....1055

One-Man Cars for Tacoma—*By K. C. Schluss.*
Line Car Saves Railroad $2,000 a Year.
Track Repairs Speeded Up by Use of Oxy-Acetylene Tools.
Carbon Brushes Recut with Carborundum Wheel—*By E. R. Pike.*
Gasoline-Propelled Inspection Car Gives Good Service.
Heat Losses in Steam Plants—*By H. F. Lawrence.*
Railroad Constructs Temporary Drawbridge at Seattle, Wash.
Condenser Pipes Cleaned by Sand Blast—*By J. C. Falkner.*
Worn-Out Rail Used as Steel Ties in Concrete Foundation.
Special Tie Plate Holds Rail to Gage and Alignment in Addition to Supporting It.
Reinsulating Wire at Less Than One Cent Per Pound.
Old Trolley Retriever Used to Coil Up Test Leads.

EDITORIALS 1035

Valuable By-Product of the War.
Relief Needed for Up-State Roads.
Economy in Fuel and Man Power a National Duty.
Steel Wire to the Rescue.
Functions of the Association Manager.
Becoming Better Acquainted with the Power Plant.
The 6-Cent Fare a National Issue.

"SAFETY CAR" OPERATION 1044

NEW YORK FARE HEARINGS POSTPONED..1047

NOVEL LOCOMOTIVE FOR THE PENNSYLVANIA 1048

KEEPING SURFACE RAILWAY TRACKS CLEAR 1050

A BRITISH TRAMWAY IN WARTIME.....1050

TAKING CARE OF CORNER STRESSES FROM LARGE D. C. FEEDERS...............1051

AMERICAN ASSOCIATION NEWS.........1053

COMMUNICATIONS 1054

PUBLICITY AGENTS MEET..............1054

NEWS OF ELECTRIC RAILWAYS..........1061

Chicago Men Reject Increase.
Washington Strike Inquiry.
Chicago Traction Bills Passed.
Bids Asked for Cascade Electrification.
Seattle Bridge Conferences Fail.
"Times" Tackles Toledo Traction.
Relief Opposed in Rhode Island.
Commission to Govern City Utilities.
Mattoon-Charleston Service Interrupted.
Estimates of Extensions Under Way.
West Side Bills Signed.
Rapid Transit Progress in New York.

FINANCIAL AND CORPORATE............1066

Canadian Earnings for 1916.
Report of Virginia Commission.
Maine Income Gains Slightly.
Indiana Tax Figures.
Connecticut Returns for 1916.
Cleveland Costs Soar.

TRAFFIC AND TRANSPORTATION.........1069

Washington Jitneys Without Bonds.
Portland Election Favorable.
Atlantic City Jitneys Lose.
New Automobile Law.

PERSONAL MENTION 1072

CONSTRUCTION NEWS 1073

MANUFACTURES AND MARKETS..........1075

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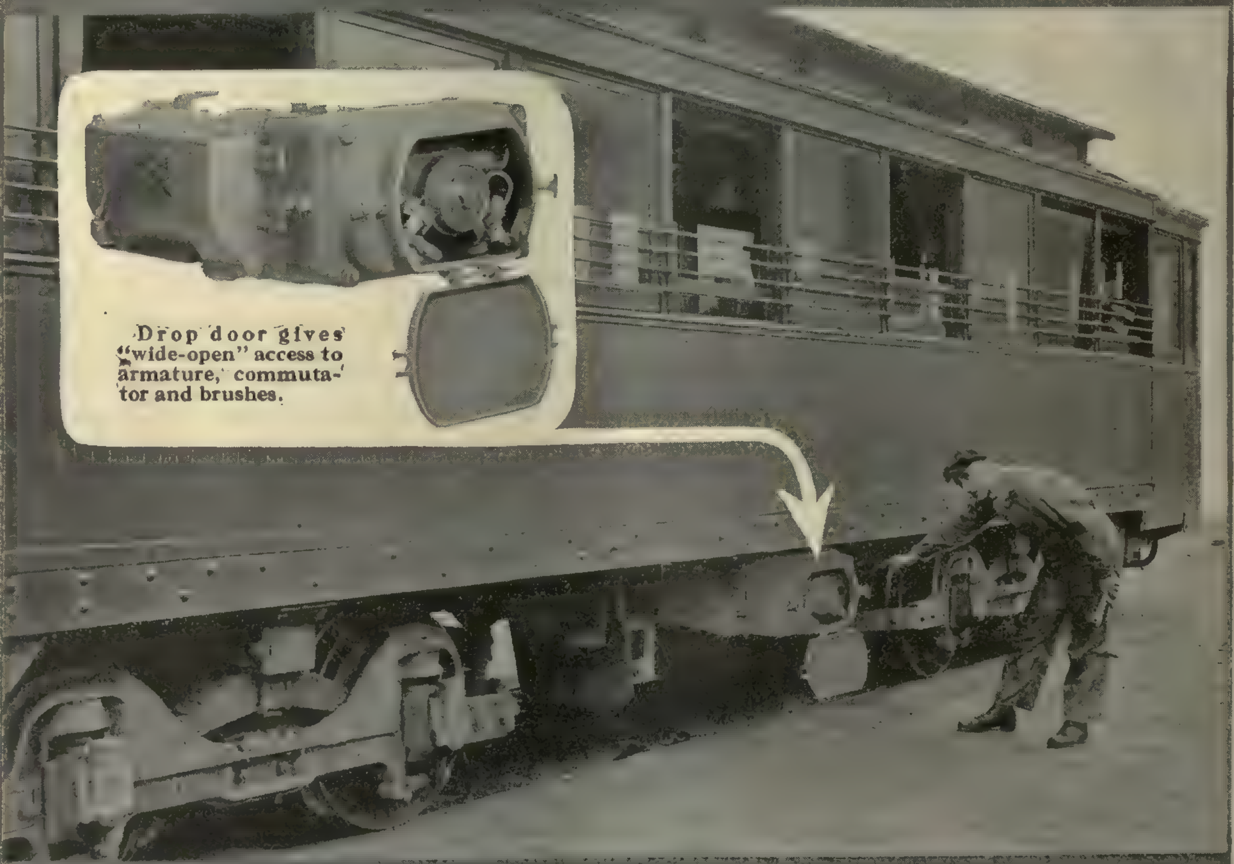

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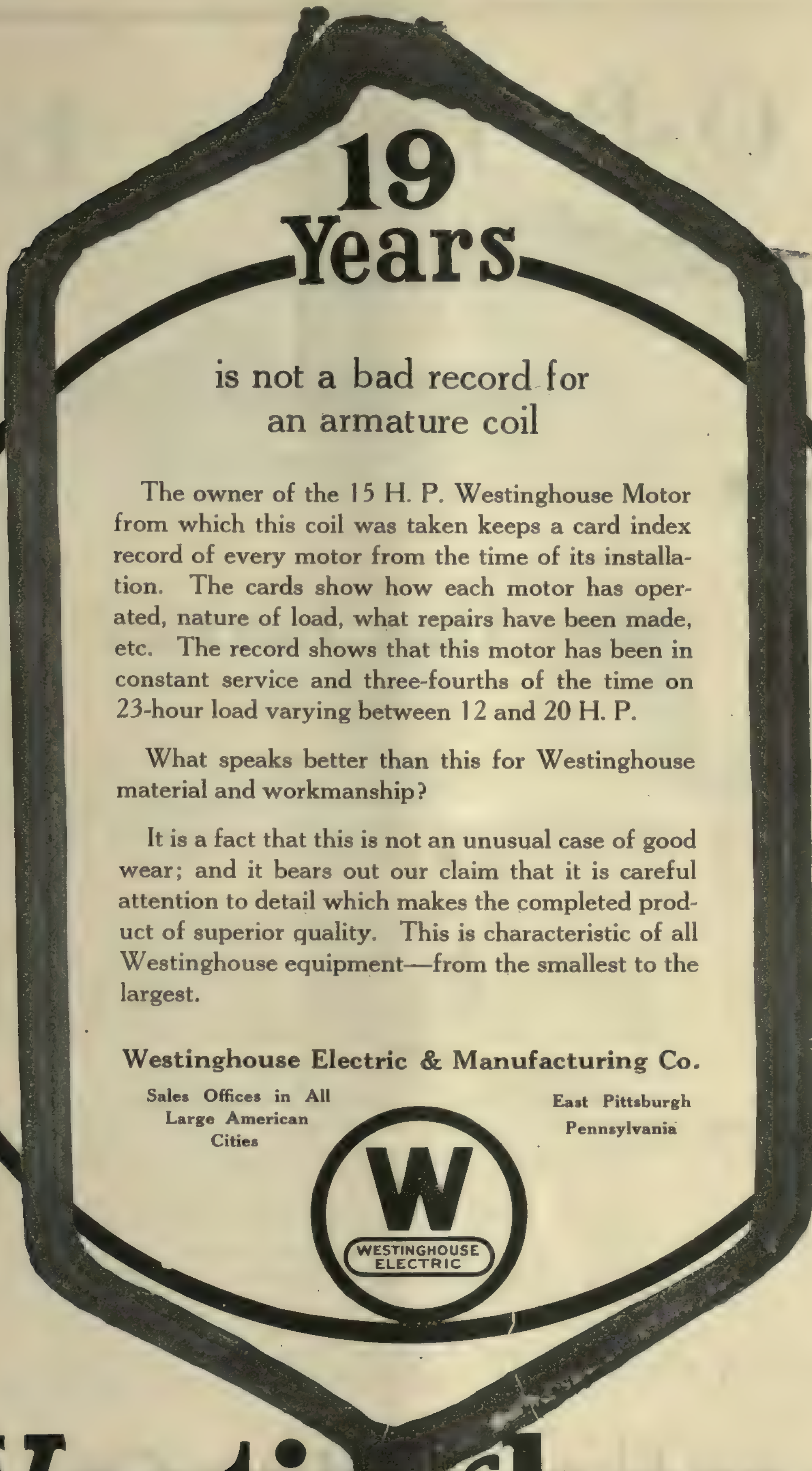

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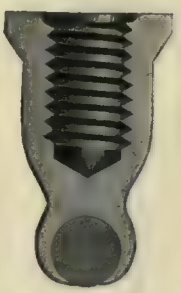
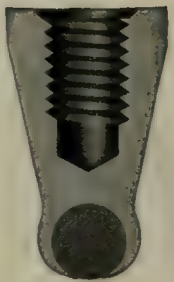
Type A Ear
(Especially recommended for curves)



Clinch Ear
Sectioned
through boss

More Than "Just Ears"



Type A Ear
Sectioned
through boss

Are Ears Ears?

There is a too prevalent idea that all trolley ears are the same; that, as they are so far standardized, so familiar, and look so much alike, there is no choice as to make. In other words that "Ears are Ears."

But there is a difference—often considerable. And we believe that O-B Ears rank at the top. Our reasons? They are below:

Uniform Metal

Of primary importance is the metal. A formula has been worked out from the results of experience and experiment. Then this formula is adhered to strictly. Close co-operation between foundry and laboratory makes uniformity certain.

Properly Proportioned

Design has been developed carefully. The metal in the lips is made thick enough to wear long and well and at the same time it is distributed so that there is a smooth underrun for the trolley wheel.

Quality Tested

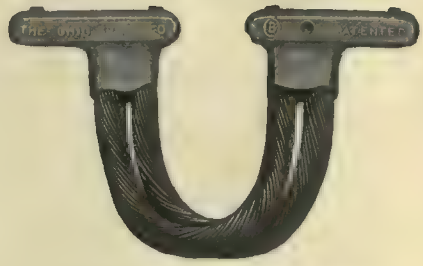
To prove that O-B Ears are ductile, representative samples are twisted and pounded severely and must come through without cracking. They are put to other tests—exaggerations of actual service. We must be satisfied that they will make good on your line so you will, thereafter, use O-B Ears exclusively.

Prompt shipment from stock. Made for every size and style of wire. Pages 166-173, Cat. No. 16

The Ohio Brass Co.
Mansfield, Ohio

One method of mounting welding equipment

Two Men Are a Gang



O-B Type G-W Bond—Patented

One man to do the actual welding, one man to clamp bond on rail, help handle equipment, etc.—that is an O-B Gas-Weld Bonding crew.

It is unnecessary to grind the rail although scale should be removed with a coarse file.

And since the equipment is light two men can move it easily from joint to joint and on and off the track.

O-B Gas-Weld Bonds are not difficult to install. It takes but a short time to learn to put them on right. Then, on the rail, they make an intimate permanent low resistance union.

"O-B Gas-Weld Bonding" sets forth the details of the process concisely. Shall we send a copy?

The Ohio Brass Co.
Mansfield, Ohio

America Wins!

THE German secret process of manufacturing the so-called carbolineum or anthracene wood preserving oils is no mystery to the chemists of The Kettle River Company, the largest producer of creosote products in the United States.

In 1914 when the great European Conflict suddenly ended all importations of European wood preserving oils, The Kettle River Company immediately erected stills and the other machinery necessary to produce wood-preserving oil in the United States.

For practically three years the entire output of this high grade pure coal tar distillate oil has been sold under the trade-mark of a selling organization formerly handling the imported European oil.

The Kettle River Company is now marketing its highest grade wood preservative through its own sales organization, under the regular Kettle River Brand.

K-R-Wood Preserver

K-R-Wood Preserver is made in America for Americans. It is the highest grade of all the so-called carbolineum oils ever produced. An affidavit of Quality and Origin will be furnished by the Kettle River Company upon request.

K-R Wood Preserver is obtainable direct from the manufacturer or through distributors listed below:

THE KETTLE RIVER COMPANY

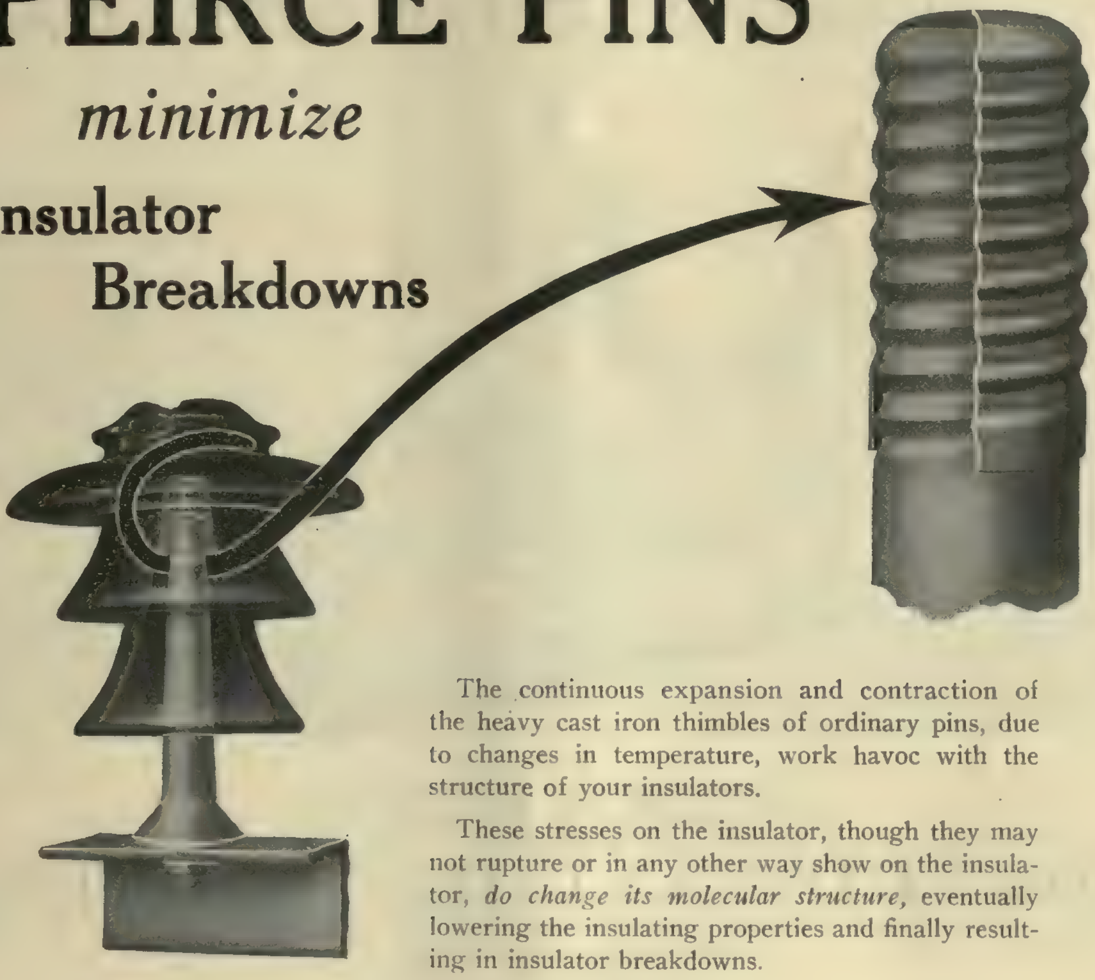
MINNEAPOLIS, MINNESOTA

New York—	American Chemical & Mfg. Co., 149 Broadway.
Cleveland—	C. H. Hoyt, 412 Citizens Bldg.
Pittsburg—	Monongahela Wood Preserving Co., Fulton Bldg.
Chicago—	James A. Kenny, Webster Bldg.
St. Louis—	F. A. Bobel, 1002 Title Guarantee Bldg.
New Orleans—	C. T. Patterson Co. Ltd.. 801 Tchoupitoulas St.
Louisville—	J. B. Wilkinson, Starks Bldg.
Portland, Ore.—	W. W. Gordon & Co., Ainsworth Building
Beaumont, Texas—	E. L. Wilson Hardware Company
Norfolk, Va.—	American Chemical & Mfg. Co.
San Francisco—	C. H. Johnson, Rialto Bldg.
Havana, Cuba—	Thos. F. Turull, Muralla 2 y 4

PEIRCE PINS

minimize

Insulator
Breakdowns



The continuous expansion and contraction of the heavy cast iron thimbles of ordinary pins, due to changes in temperature, work havoc with the structure of your insulators.

These stresses on the insulator, though they may not rupture or in any other way show on the insulator, *do change its molecular structure,* eventually lowering the insulating properties and finally resulting in insulator breakdowns.

Peirce Forged Steel Pins

have been designed to take care of this expansion by incorporating the "drawn steel thimble."

The threads of the thimble fit loosely over the threads of the pin, and a thin cork disc is provided between the top of the pin and the cap of the thimble, to insure a secure fit between insulator and pin. Under expansion the pin simply rides up further on the thimble, the cork disc compressing.

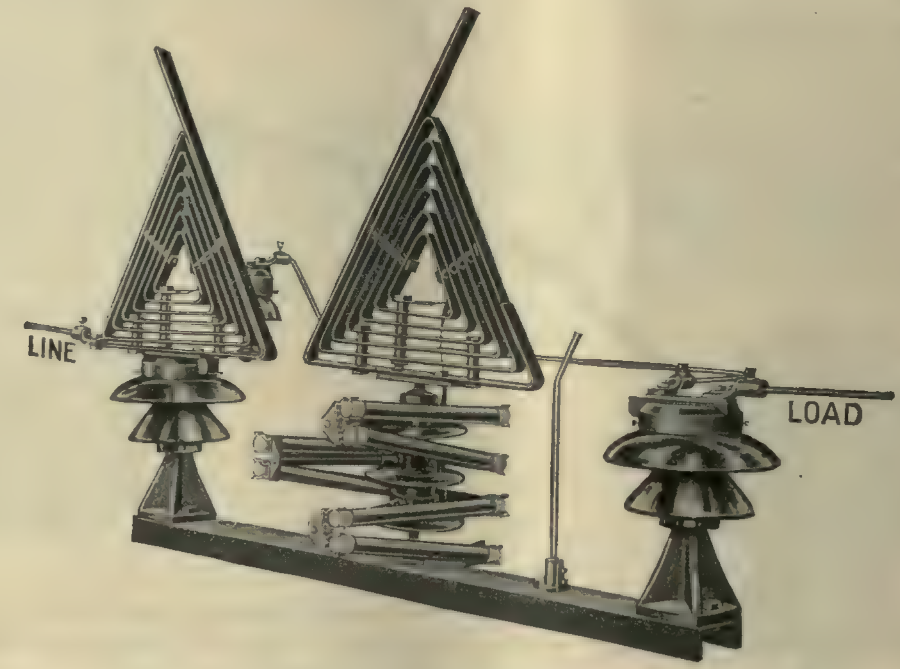
Peirce pins are guaranteed to stand strains equal to their rated strength with a deflection of less than 10 degrees, and without danger to the insulator.

Our booklet tells about "Continuity—and How" to obtain it. Send for a copy.

The Hardware MAKES the Line—Hubbard makes THE Hardware

HUBBARD AND COMPANY
PITTSBURGH

Have you installed new Lightning Arresters since you extended your Transmission Lines?



BURKE SERIES
HORN GAP LIGHTNING ARRESTERS
(Type WBR)

Are Especially Designed to Meet the New Conditions

Remember, when you extend your lines you also increase their capacity. And experience has shown that lightning arresters that have been entirely successful on lines of moderate capacities may prove much less satisfactory when those lines are extended and their capacities thus increased.

Realizing the necessity of meeting the pressing demand resulting from these conditions for arresters capable of withstanding and discharging repeated surges of very high capacity, we have developed our new *Type* WBR *Burke Series Horn Gap Arrester.*

Type WBR is so designed and constructed that a surge of highest capacity is instantly and effectually relieved from the line without causing any noticeable disturbance on the transmission system and without injury to itself from either surges or lightning discharges. Type WBR will be found highly efficient on transmission systems of heaviest capacity where very high capacity surges or lightning disturbances are often experienced. Write for *special bulletin.*

Railway & Industrial Engineering Co.

Pittsburgh, Pa.

New York Office: No. 2 Rector Street

"Golden Glow" Headlights Light up the Way to Willow Grove—Philadelphia's Famous Resort

Almost every night throughout the Summer these "Willow Grove" cars will operate at full capacity, at high speed and with short headway through the rural section between Philadelphia and Willow Grove.

Their "Golden Glow" Headlights will project steady, powerful beams of golden light. These golden beams will light up the road-bed 'way ahead, provide an effective warning when approaching grade-crossings and add in many ways to the safety of the thousands of patrons who will visit this resort.

The Philadelphia Rapid Transit Co. were quick to realize the importance of "Golden Glow" Headlights on this most popular interurban branch.

You, too, should use "Golden Glow" with their famous reflectors.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto

Phono-Electric

—The Wire of Long Life

Measured 0.475 in. in 1908
0.4614 in. in 1916

That's the **maximum** wear after eight years of 60 miles an hour pantograph service on the Denver & Interurban Railway with Phono-Electric Trolley Wire.

Do you believe that a **copper** wire of 0000 section could have served thirty-two to forty-five trains a day without having been distorted, worn, burnt or broken in many places?

Of course it couldn't! When the builders of this great high-tension road (11,000 volts) wanted a trolley wire that would stay up in all stress of wind and weather they selected Phono-Electric.

Do it, too.

Bridgeport Brass Company
Bridgeport Connecticut

There's an ERICO Bonder

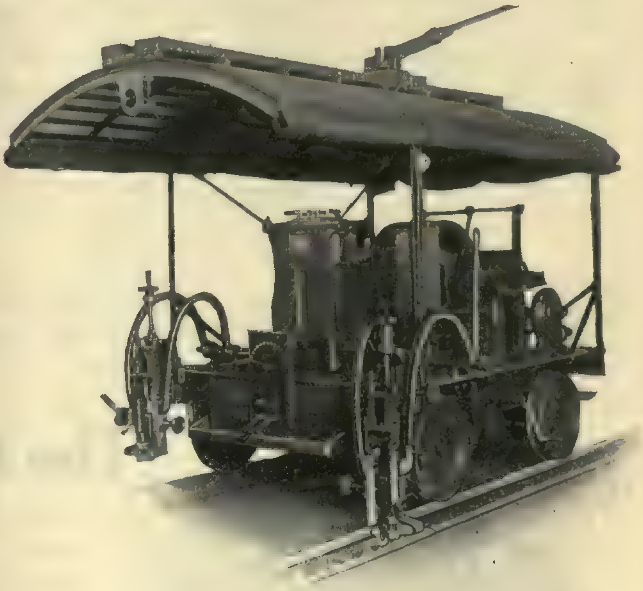
For Each Kind of Traffic or Voltage

Since the perfection of the Erico Bond, our chief aim has been to develop the best means of applying the Bond.

Various forms of Erico bonding equipments are now in use and all are making good—not alone for every character of traffic but also for low-voltage d.c., high-voltage d.c. and single-phase.

While the means for welding differ, we wish to emphasize that

The Bond Is Always an ERICO Welded Bond



ERICO

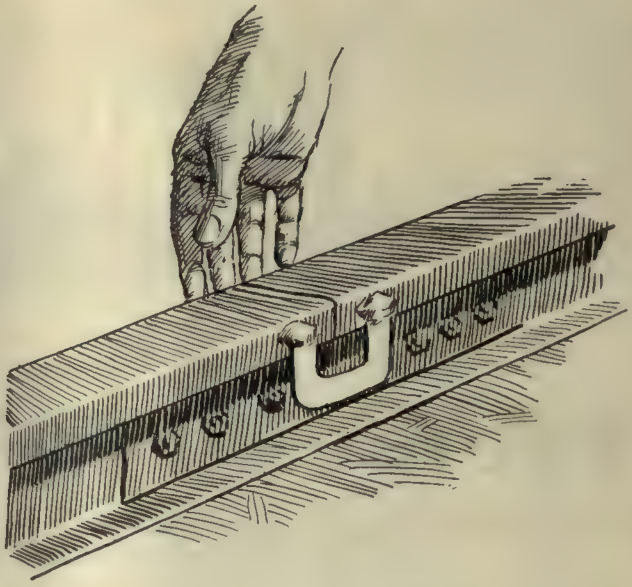
THE LINE OF LEAST RESISTANCE

The Electric Railway Improvement Co.

Cleveland

You can place your hand opposite a

LINCOLN BOND



a moment after the weld is completed without being burned!

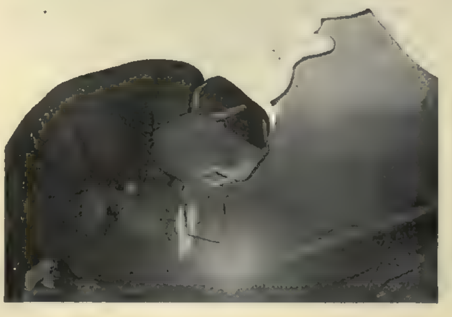
This means two things:

It shows the extreme rapidity of the welding operation, and the short time of heating makes it impossible to harm the inherent structure of the rail.

And the main point is that by making the rail positive, the copper and steel run together, assuring an absolute union.

You can try one at our expense. Write us!

"A true Integral Weld made in the shortest time at minimum cost and without resistance losses."

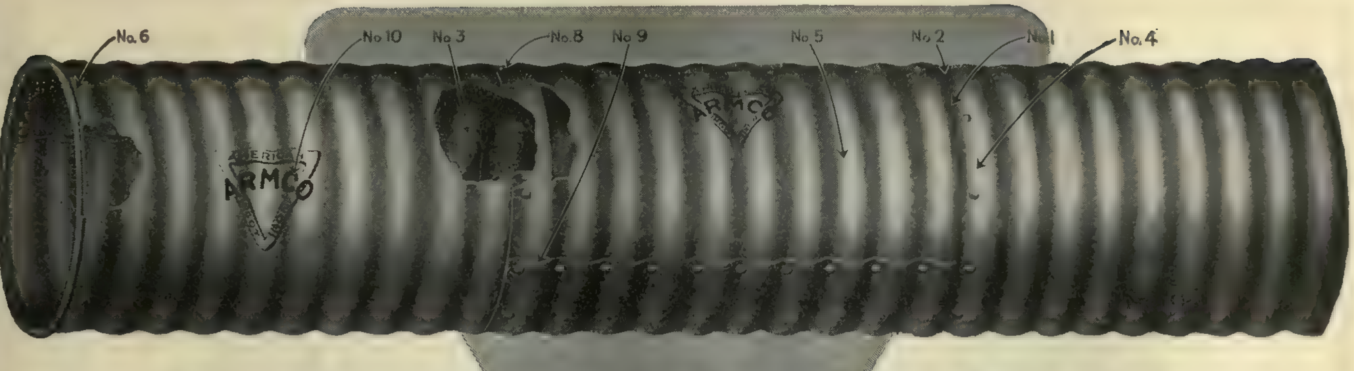


The Lincoln Bonding Co.

636 Huron Road
CLEVELAND, OHIO

AGENTS:

LEWIS & ROTH COMPANY
1012 Liberty Bldg., Philadelphia, Pa.
114 Liberty St., New York City, N. Y.
CHARLES N. WOOD COMPANY
14 Federal St., Boston, Mass.
HOLDEN & WHITE, Inc.
343 S. Dearborn St., Chicago
W. C. BURDICK
808 First Nat'l Bank Bldg., Milwaukee, Wis.



TEN REASONS WHY "ARMCO" IRON CULVERTS

1 **Solid Construction.** In the manufacture of "Armco" Iron Culverts the seams are *tightly* and *evenly* cinched. Before riveting sufficient power is applied to secure the ideal of closeness in each and every joint.

2 **Rivets are ample in size and number.** They are closely spaced and properly driven. They are made from the same metal as the pipe. Compare the riveting of "Armco" Iron pipe with that of ordinary material.

3 **The rivets are always properly upset**—never crushed between the plates. The inside of the pipe as well as the outside will bear the closest inspection.

4 **The pipe is straight and even.** The joints are not to be loosened by bending or swaying. Try the experiment of lifting one end of a sixteen or eighteen foot "ARMCO" Iron Culvert of small diameter and *jouncing* it up and down as hard as you can. You cannot loosen the joints or damage the pipe. This is one good test for corrugated pipe in general.

5 **"ARMCO" Iron Culverts carry the maximum quantity and quality of galvanizing.** This material has a great superiority over substitute metals in its ability to take a heavy coating of pure zinc, *and retain it under forming operations.* "ARMCO" Iron Culverts meet the United States Government specifications of two ounces of galvanizing to the square foot.

6 **Protection for the Culverts in shipping and installing and after they are placed in service is secured by the rodded end.** A heavy rod is rolled into the end sections. It gives ample reinforcement exactly where it is needed, and entirely does away with battered and bruised ends and the danger to stock from the exposed edges of unprotected corrugated pipe. This development also results in giving the culvert a finished and handsome appearance.

7 **Strong, convenient and lasting coupling devices** are provided where it is necessary to ship the pipe in more than one section to be joined in the field. This is an element not to be despised when considering long service under varied conditions.

8 **Toughness and resiliency** are qualities of thoroughly well made corrugated pipe. "Armco" Iron Culverts are capable of withstanding conditions caused by freezing and thawing or by settling and shifting foundations which are speedily fatal to many otherwise excellent constructions.

9 **Plates and rivets are always of gages and dimensions specified.** There is no skimping of metal. The Culverts are always of full gage *all the way through and not merely at the end sections.* The size of the pipe is that of the *net internal diameter*, and the length is that stated on the invoice. Put them on the scales and see whether they weigh what they should. That is a quicker and surer method than gaging, and is readily applicable to any culvert. *See that you get what you pay for.*

10 **Their material is "ARMCO" (American Ingot) Iron**—the *purest*, most *even* and most *durable* of all metals available for culvert use. The "Armco" Triangle Brand is everywhere a guarantee of quality. On corrugated culverts it indicates the recognized standard as to material and construction.

For full information on Rust-Resisting "Armco" Iron Culverts, Flumes, Siphons, Sheets, Roofing and formed Products, write the nearest manufacturer.

Arkansas, Little Rock—Dixie Culvert & Metal Co.
California, Los Angeles—California Cor. Culvert Company
California, West Berkeley—California Corrugated Culvert Company
Colorado, Denver—R. Hardesty Mfg. Co.
Delaware, Clayton—Delaware Metal Culvert Co.
Florida, Jacksonville—Dixie Culvert & Metal Co.
Georgia, Atlanta, Dixie Culvert & Metal Co.
Illinois, Springfield—Illinois Corrugated Metal Co.
Indiana, Crawfordsville—W. Q. O'Neall Co.
Iowa, Des Moines—Iowa Pure Iron Culvert Co.
Iowa, Independence—Independence Cor. Culvert Co.
Kansas, Topeka—The Road Supply & Metal Co.
Kentucky, Louisville—Kentucky Culvert Co.
Louisiana, New Orleans—Dixie Culvert & Metal Co.
Maryland, Baltimore—Wm. M. Baker, Munsey Building
Massachusetts, Palmer—New England Metal Culvert Company
Michigan, Bark River—Bark River Bridge & Culvert Company
Michigan, Lansing—Michigan Bridge & Pipe Co.
Minnesota, Minneapolis—Lyle Corrugated Culvert Company
Minnesota, Lyle—Lyle Corrugated Culvert Co.
Missouri, Moberly—Corrugated Culvert Co.
Montana, Missoula—Montana Culvert & Flume Co.
Nebraska, Lincoln—Lee-Arnett Co.
Nebraska, Wahoo—Nebraska Culvert & Mfg. Co.
Nevada, Reno—Nevada Metal Mfg. Co.
New Hampshire, Nashua—North-East Metal Culvert Company
New Jersey, Flemington—Pennsylvania Metal Culvert Company
New York, Auburn—Pennsylvania Metal Culvert Co.
North Dakota, Wahpeton—Northwestern Sheet & Iron Works
Ohio, Middletown—American Rolling Mill Co. The Ohio Corrugated Culvert Co.
Oklahoma, Shawnee—Dixie Culvert & Metal Co.
Oregon, Portland—Coast Culvert & Flume Co.
Pennsylvania, Warren—Pennsylvania Metal Culvert Company
South Dakota, Sioux Falls—Sioux Falls Metal Culvert Company
Tennessee, Nashville—Tennessee Metal Culvert Company
Texas, Dallas—Wyatt Metal Works
Texas, El Paso—Western Metal Mfg. Co.
Texas, Houston—Lone Star Culvert Co.
Utah, Woods Cross—Utah Corrugated Culvert & Flume Company
Virginia, Roanoke—Virginia Metal & Culvert Co.
Washington, Spokane—Spokane Corrugated Culvert & Flume Co.
Wisconsin, Eau Claire—Bark River Bridge & Culvert Company

Canada: Canada Ingot Iron Co., Ltd., Guelph, Sherbrooke, Winnipeg, Calgary

With Track Like This

you are paying for a

Reciprocating Track Grinder

whether you buy it or not

When cupping, corrugations or indentations **begin** to show in the rails—that's the time to get a Reciprocating Grinder at work.

Bad track conditions never cure themselves. They just keep on getting worse unless they are taken in hand vigorously and given thorough treatment.

And the worse they get the more expensive they are to remedy when the remedy is eventually applied.

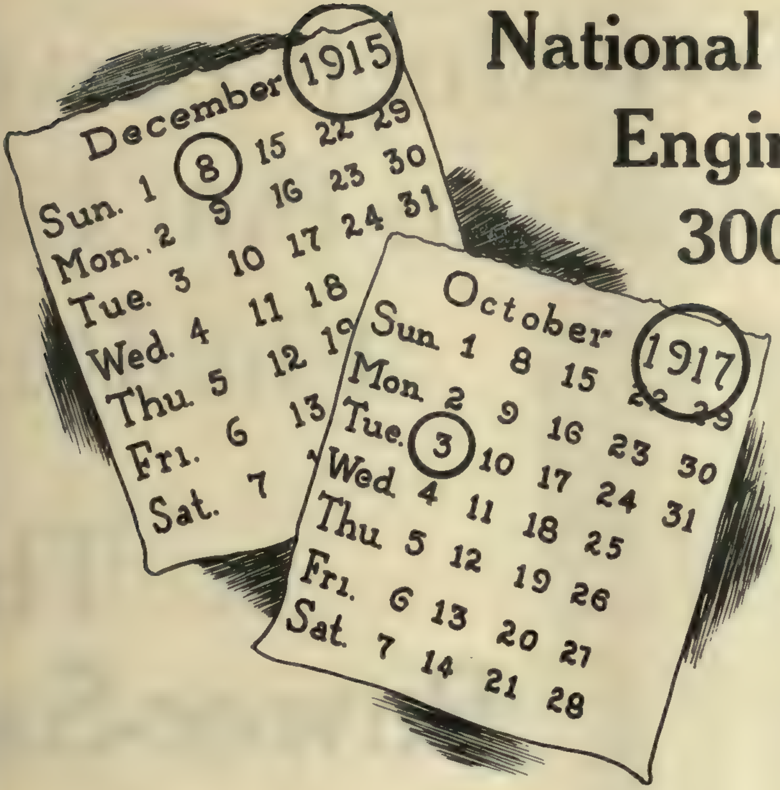
If corrugations and cupped joints are permitted to "take care of themselves," they grow steadily deeper under the impact of the car wheels. Instead of it being an easy and expeditious matter to grind the rail to a smooth condition it requires much more labor and time and necessarily demands **the removal of more of the wearing surface** than would have been the case if grinding were done promptly upon the first appearance of trouble.

When rails need grinding, every month of delay simply **adds** to the ultimate expense.

Let us prove to you on your own tracks what an economical adjunct to maintenance a Reciprocating Grinder is.

Railway Track-work Co.

30th and Walnut Streets, Philadelphia, U. S. A.



National Pneumatic Engines will make 300,000 Movements between Lubrications:

666 Days!

Can you realize the import of a specification like that of the New York Municipal Railway Corporation, Brooklyn, which asked for a door engine capable of making 300,000 movements between lubrications?

It means that on the basis of 450 complete operations per door per day of the engine, it would not have to be lubricated for 666 days, or nearly two years.

This specification has been met easily by National Pneumatic engines because the rack, the gear, gear shafts and piston washers run in a continuous bath of grease.

And they'll stay lubricated over any range of temperature, too!

NATIONAL PNEUMATIC COMPANY

50 Church St. New York

515 Laflin St. Chicago

Putting Too Much Powe
Is Like Trying to Put To
The Resu

The
Power-Sav
Prevents

Because it educates the motorman to the fact that if he keeps his power on too long or gets up more speed than is necessary to run a given distance within a given time he simply has to take this excess power out of the car by setting his brakes so much the sooner and keeping them on so much the longer.

The Arthur Power-Saving Recorder is an extremely simple, purely mechanical device which is operated by the air brake system.

As long as the brakes are not operated the mechanism of the Recorder is inactive. The instant the brake is operated, however, the mechanism starts and operates two dials. The upper dial shows the length of time in minutes for which the brake is applied. The lower dial shows the number of times the brake is operated whether for a slow-down or for a full stop.

If one motorman makes a given schedule with a lower record of braking time and a lower number of brake operations than are shown by another motorman making the same run under the same general conditions it is conclusive evidence that the first man has

If interested in power-saving, investigate the merits o

The Arthur Power-Saving Recorder Co.
New Haven, Conn.

in a Car for a Given Run
Much Water in a Tumbler
t is Waste

Arthur
g Recorder
this Waste

used less power because he has taken out less power at the brake shoes. In other words, he has used his power effectively and has not spilled or wasted it.

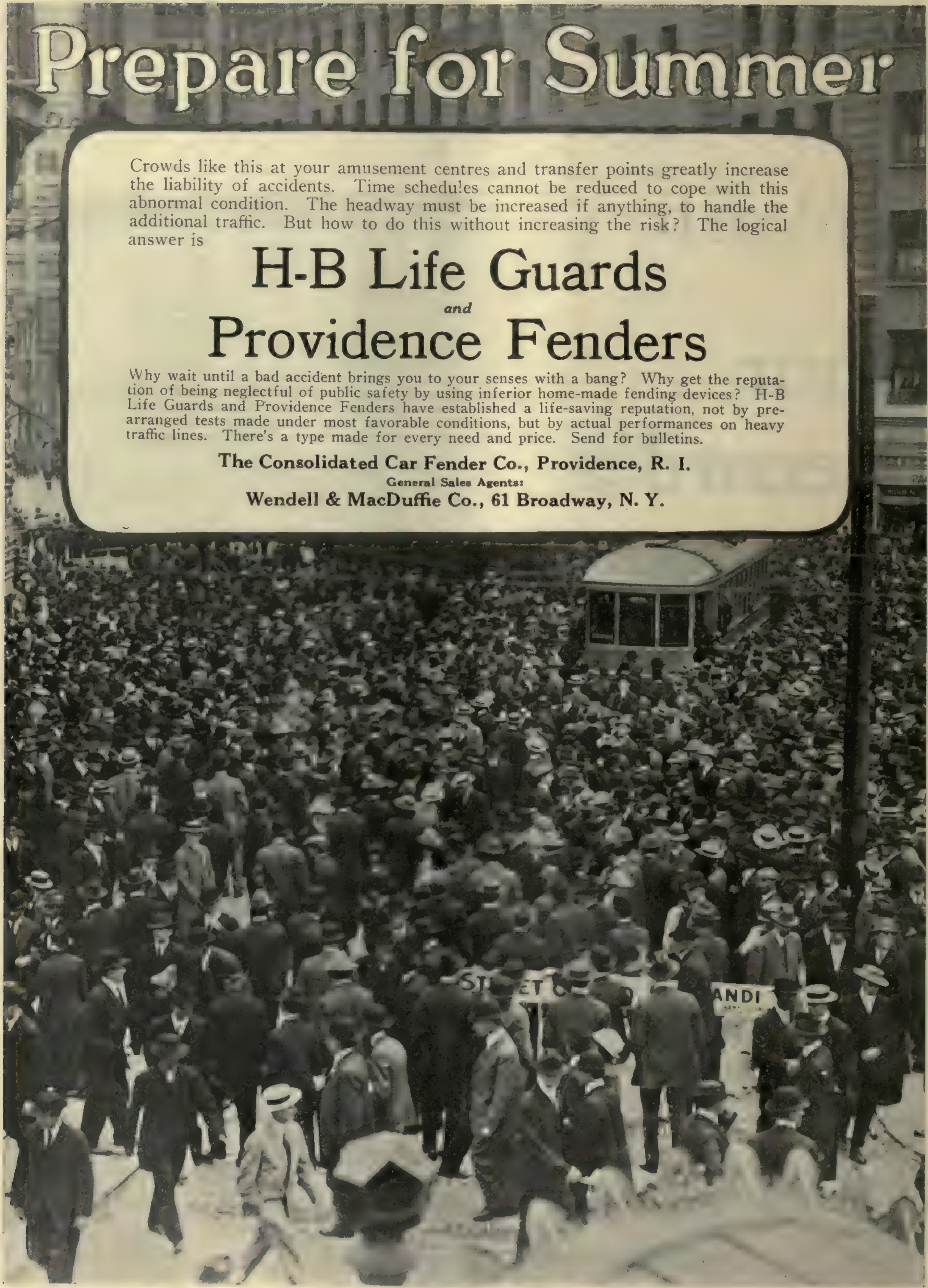
In addition to this the first man has not only used less power but he has decreased the wear on brake shoes and wheels.

The ability of the Arthur Power-Saving Recorder to save power and to decrease wear on brake shoes and wheels has been clearly proven in service and can be readily demonstrated on your cars. The Connecticut Company, after installing 200 Power-Saving Recorders, increased their order to cover practically all passenger cars in the State of Connecticut. This is evidence of real merit.

It has definite advantages from the standpoint of safety in car operation—gives an unquestionable record on which to compare the work of your men—is well liked by the car operatives and is extremely economical to buy and to use.

his new Recorder. Its simplicity will appeal to you.

The Arthur Power-Saving Recorder Co.
New Haven, Conn.



Prepare for Summer

Crowds like this at your amusement centres and transfer points greatly increase the liability of accidents. Time schedules cannot be reduced to cope with this abnormal condition. The headway must be increased if anything, to handle the additional traffic. But how to do this without increasing the risk? The logical answer is

H-B Life Guards
and
Providence Fenders

Why wait until a bad accident brings you to your senses with a bang? Why get the reputation of being neglectful of public safety by using inferior home-made fending devices? H-B Life Guards and Providence Fenders have established a life-saving reputation, not by prearranged tests made under most favorable conditions, but by actual performances on heavy traffic lines. There's a type made for every need and price. Send for bulletins.

The Consolidated Car Fender Co., Providence, R. I.
General Sales Agents:
Wendell & MacDuffie Co., 61 Broadway, N. Y.

Give the Motorman a Bogie

In golf, bogie is the score which the average player should make over a given course. It does not represent **perfect** golf, but is a score which a good player can equal, or exceed.

The Economy Meter

establishes a "bogie" for the motorman. It tells him how much energy he has used to cover a given run. Comparison of his own average with that made by other motormen who work under the same conditions shows his standing.

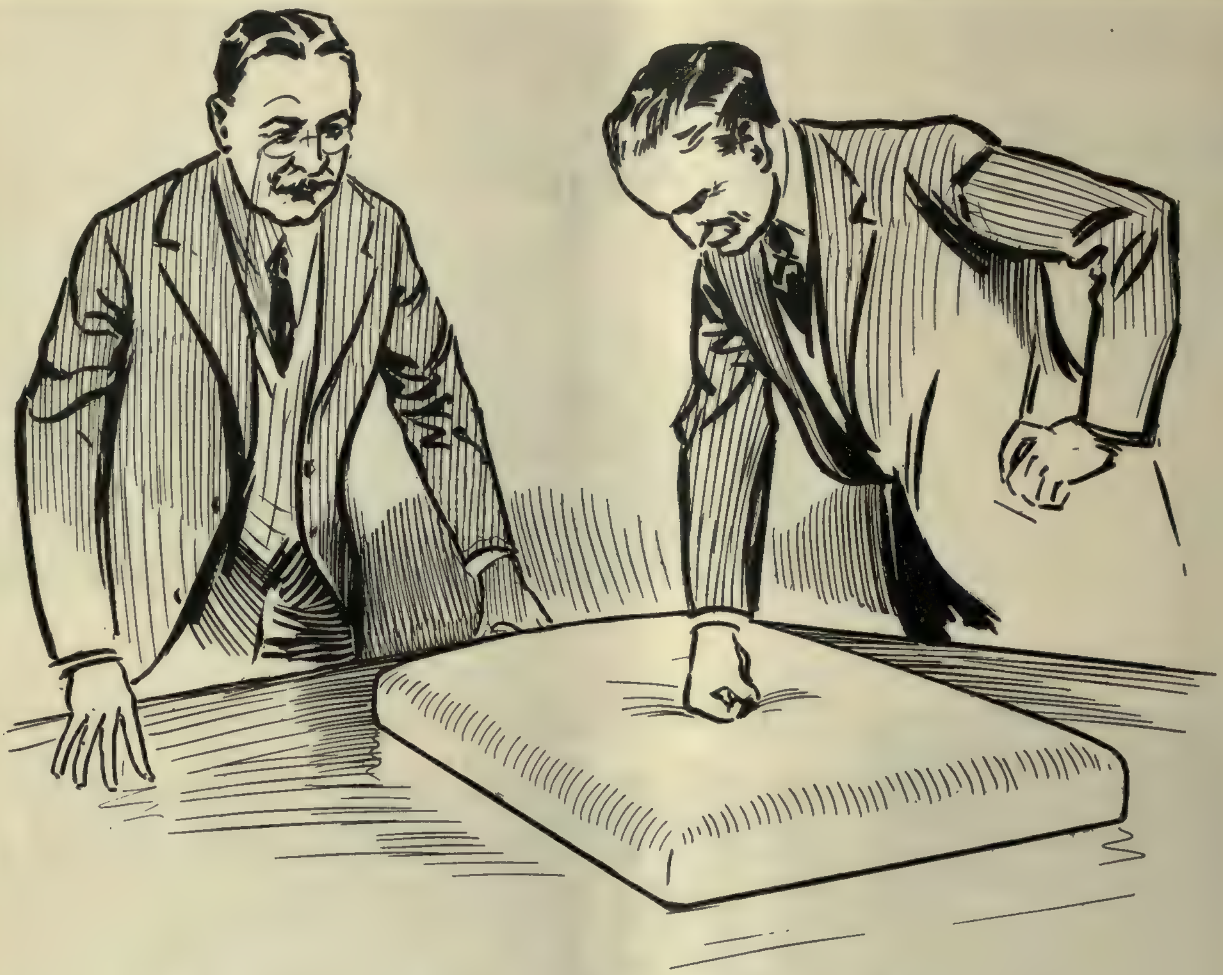
He may never attain **perfect** operation, but he will continually try to equal the record set by the most skillful motorman.

The result will be a decided saving in energy consumption—a saving which will pay for the meter investment in a few months. Part of Economy Service is in training your motormen to use current in the most economical way.

ECONOMY
SANGAMO
BUILT LIKE A WATCH
METERS

Sangamo Electric Company
Springfield, Illinois

Specialists in Meters for Every Electrical Need



Hale & Kilburn Seats are Right to the Core

There's much more to Hale & Kilburn seats than correct shape and appearance.

Take a Hale & Kilburn rattan cushion, for example.

Cemented to the underside of the rattan is a canvas lining. This serves for general reinforcement and also discourages damage from the vandal's knifing.

Below this canvas are spring bands of corrugated, tempered steel, which together with the skeleton work, are also covered with protecting fabric. These bands are supported by spiral springs of special temper.

So that the cushion retains its original, comfortable shape year after year despite the hardest usage.

Hale & Kilburn seats will bear looking into!

Pioneers in Steel Trim for Passenger Cars, including interior finish, steel doors, etc.

HK WALKOVER COPYRIGHTED

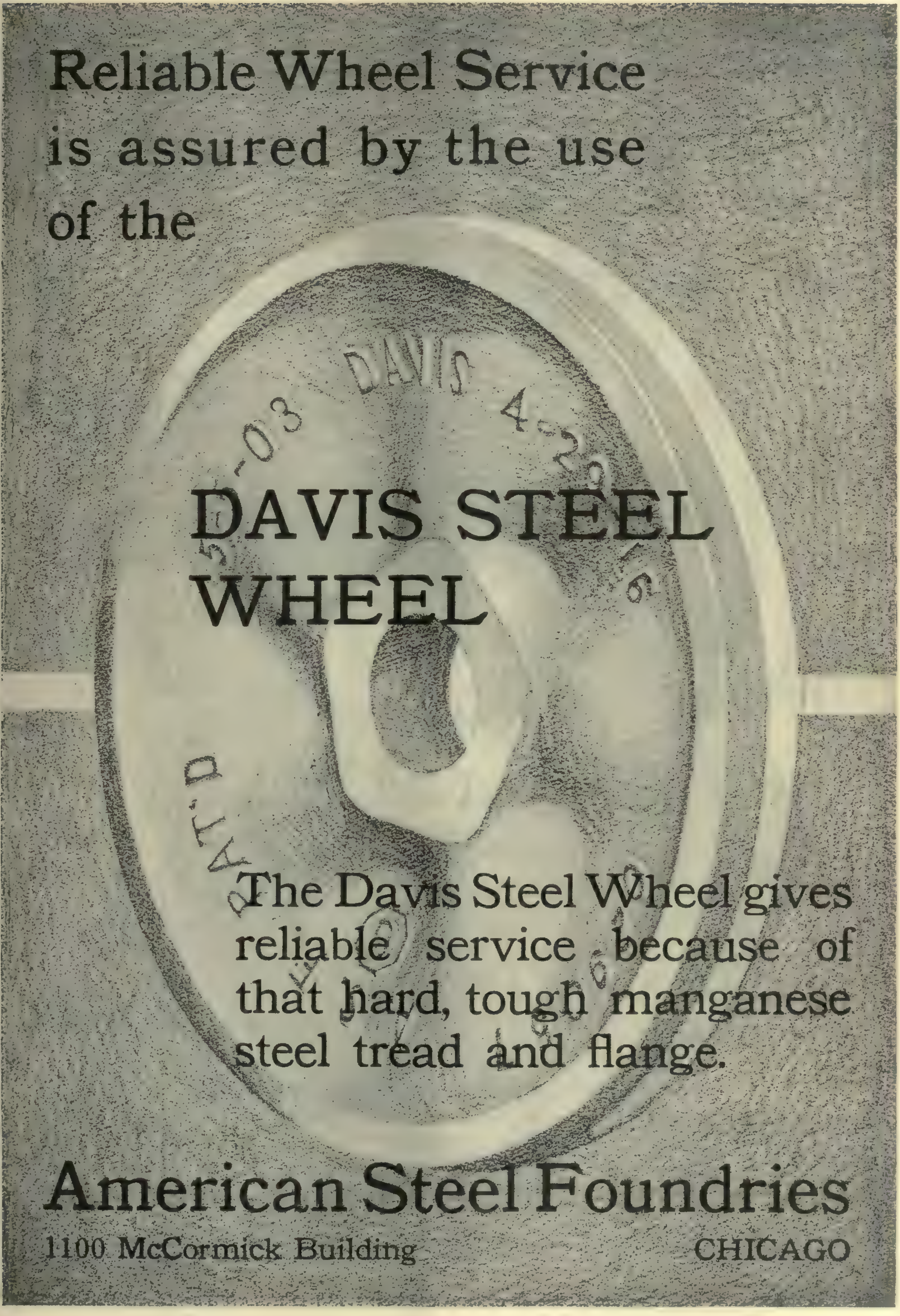
Hale and Kilburn Co.

Philadelphia
Washington

New York
Atlanta

Chicago
San Francisco

HK WALKOVER COPYRIGHTED



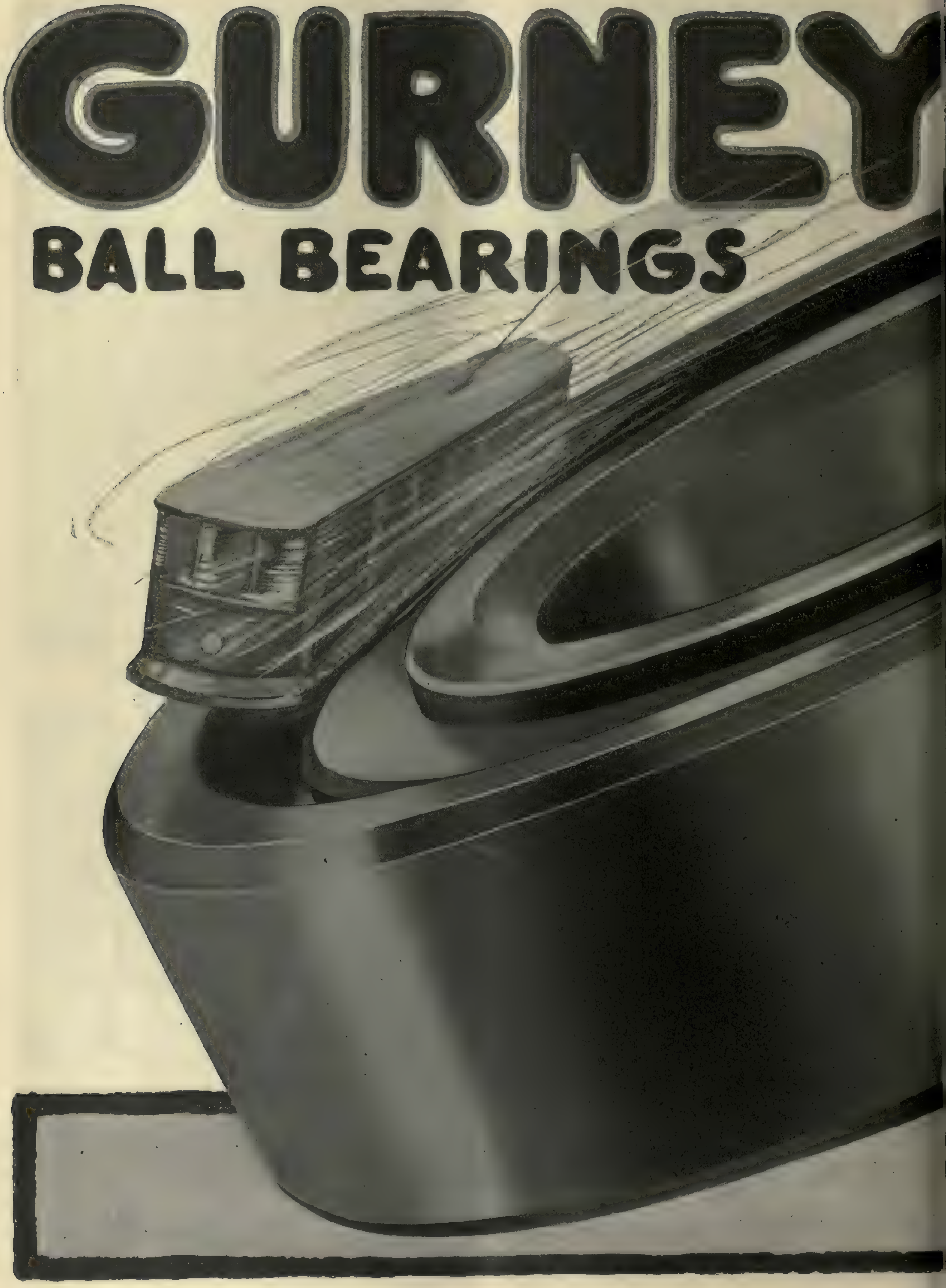
Reliable Wheel Service is assured by the use of the

DAVIS STEEL WHEEL

The Davis Steel Wheel gives reliable service because of that hard, tough manganese steel tread and flange.

American Steel Foundries

1100 McCormick Building CHICAGO


GURNEY
BALL BEARINGS

*Specify Gurney for Motors
and Journal Boxes*

GURNEY BALL BEARING CO.

Conrad Patent Licensee

Chicago, Ill. Jamestown, N.Y. New York City.

151

Columbia-Made Valves and Other Things

In this little corner of our tool and die department we handle valves and other parts requiring precision. The fact that we make so much heavy work does not preclude us from having a department for articles that have to be gaged to the thousandth part of an inch. Our line of tools, jigs, patterns and templets would amaze you.

TOOLS

Armature and Axle Straighteners
Armature shaft straighteners
Armature buggies and stands
Babbitting molds
Banding and heading machines
Car hoists
Car replacers
Coil taping machines for armature leads
Coil winding machines
Pinion pullers
Pit jacks
Signal or target switches
Tension stands

CAR EQUIPMENT

Armature and Axle Bearings
Armature and field coils
Bearings (Axle and Armature)
Brush-holders and brush-holder springs
Brake, door and other handles
Brake forgings, riggings, etc.
Car trimmings
Commutators
Controller handles
Forgings of all kinds
Gear cases (steel or mall. iron)
Grid resistors
Third-rail shoe beams and accessories
Trolley poles (steel) and wheels

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St., Brooklyn, N. Y.

W. R. Kerschner Co., Inc., N. Y.   Holden & White, Inc., Chicago   F. F. Bodler, San Francisco

This New Book Shows the Way to Better Methods and Increased Earnings for Electric Railways

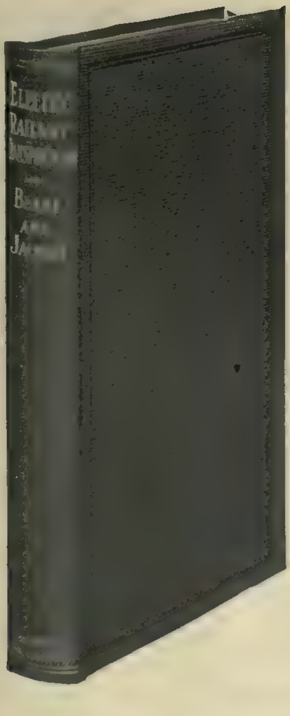
It emphasizes the close relation between efficient transportation methods and financial success.

It covers the important recent developments in transportation methods and shows clearly their effect on earnings.

Just Issued

Electric Railway Transportation

By **HENRY W. BLAKE,** Editor, Electric Railway Journal, and **WALTER JACKSON,** Business Manager, formerly Associate Editor, Electric Railway Journal.



The first book to cover the transportation side of the electric railway business—getting the cars over the track, increasing the traffic and collecting the fares.

The importance of the work to transportation officials and other executive officers of electric railways needs no emphasis.

The book will appeal to all electric railway officials who have anything to do with operation, as well as to officers in engineering, audit and claim departments, and to those interested financially in electric railway properties.

Chapter Headings.—I. Organization and Definitions. II. Adjustment of Service to Traffic. III. Accelerating Traffic Movement along the Line. IV. Accelerating Traffic Movement on the Car. V. Car Types in Relation to Traffic. VI. City Timetables—Preliminaries. VII. Interurban Schedules and Dispatching. VIII. Fares. IX. Fare Collection Practices and Devices. X. Public Relations. XI. Promotion of Passenger Traffic. XII. Traffic Signs for Cars, Station and Road—Information for the Public. XIII. Competition. XIV. Freight and Express Business. XV. Selection and Training of Men. XVI. Wages and Wage Agreements. XVII. Welfare Work. XVIII. Discipline of Trainmen. XIX. Forms of Extra Pay.

487 pages, 6x9, 120 illustrations. $5.00 net, postpaid.

Send No Money—Just the Coupon

The best guarantee of our confidence in the practical value of this book is our unqualified offer to send you a copy for ten days' free examination. This does not obligate you to purchase the book; if you are not entirely satisfied it will be of high value to you.

Send no money. Simply fill in and mail the coupon.

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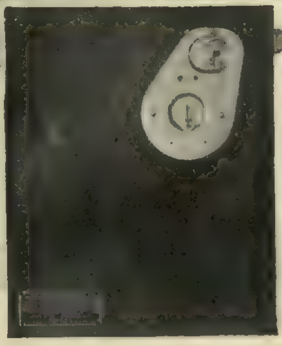

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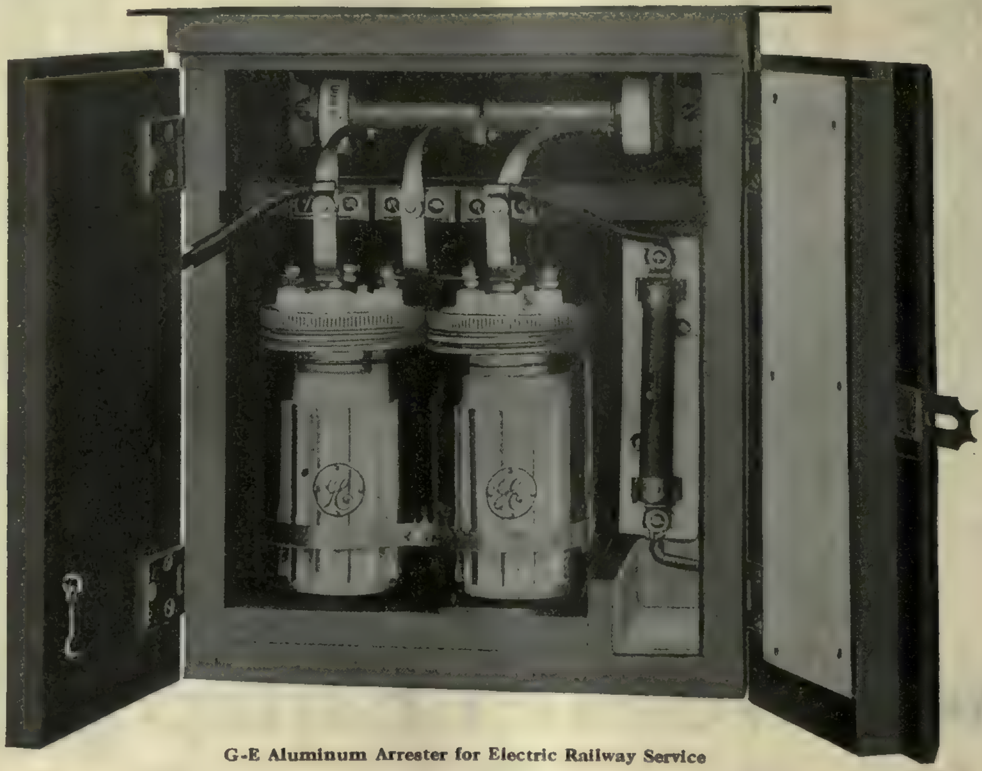

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Electric Railway Journal

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VALUABLE BY-PRODUCT OF THE WAR

Out of the turmoil and stress of this war is going to come a new solidarity in the country as a whole, and especially in the industrial and public service corporations upon which rests the prosperity of us all. Already we see indications that a seriousness and a sense of responsibility are beginning to pervade the personnel of the electric railways, in common with other groups of men organized for specific service. The result must be that internal problems can be more readily solved because employer and employee shall have been brought to realize their essential equality when matters of honor and courage are in question. There has been a great deal of unnecessary friction between capital and labor in electric railway companies during the past few years, but we sincerely hope to see, after the war has closed, that a better day for men and manager has dawned. These remarks are prompted by the accounts of patriotic mass meetings, flag-raising exercises and other group events held by electric railway companies during the past few weeks. One such meeting, at Hampton, Va., is described in this issue. The incident suggests that employees of all ranks will miss a great opportunity if they do not become better friends under the centripetal forces of this world's cataclysm.

RELIEF NEEDED FOR UP-STATE ROADS

The general facts found by Professor Conway of the University of Pennsylvania in his analysis on page 1045 of the financial conditions of the up-State New York electric railway companies will hold true, we believe, with most electric railway properties in this country. Labor and material charges, as well as taxes, have greatly increased during the last five years, and owing to these conditions companies have been forced to provide for the added facilities required by the increased traffic during this period by bond issues rather than by increases in their capital stocks. The result has been, for all of the companies in New York outside of New York City during the last five years, an increase in railway operating revenues of 15 per cent and an increase in interest charges, rentals and "other deductions" during the same time of 51 per cent. These changes were accompanied by a reduction in net income available for dividends of 78 per cent and of net income to gross income of from 41.1 to 9.1 per cent, so that there was a reduction in the percentage of net income to capital stock of from 3.44 per cent in 1911 to only 0.77 per cent in 1915. The worst part of this situation is that the conditions which brought it about are not improving; in fact, they are getting worse. We believe that if the facts are placed before the public there will be a general acquiescence in the only real relief possible, namely, higher fares. This, we hope, will be the result of the present New York State campaign.

ECONOMY IN FUEL AND MAN POWER A NATIONAL DUTY

A significant development of the past week is the announcement by a number of steam railroads of curtailment of their services by the consolidation of some passenger trains, the elimination of others with small patronage and a reduction in the number of chair, dining and observation cars to be operated. These changes are not made to increase net revenues but to conserve the fuel supply and increase the capacity of the roads for coal, food, government material and troops, and they are being carried out to conform with the recommendations of the Railroad War Board at Washington, D. C. The general situation on the steam roads, so far as the desirability of conserving the available supplies of fuel and man power is concerned, is of course the same on the electric roads, and suggests similar steps on their part. While there will be no great increase in the amount of freight to be carried or government transportation to be undertaken on the electric roads, the experience of the British tramways indicates that the passenger traffic on our electric roads will be greatly increased during the war, partly as a result of the intensive industrial conditions and partly because of the reduction in steam railroad passenger service. This condition emphasizes the necessity of introducing as a war measure all methods in electric railway operation which will economize fuel and labor and will increase track capacity where that capacity is needed. There are many such methods available, and we are confident that the public will support the companies in introducing these measures as a matter of national defense, if the need for them is fully explained.

STEEL WIRE TO THE RESCUE

When a great system like the Pacific Electric Railway finds that it can dispense with copper trolley wire and so make renewals at 12 cents a pound instead of 40 cents, other roads throughout the land will be eager to learn how the feat was accomplished. We believe that they can get all of the important facts from Mr. Anderson's article, published in this issue, telling of his successful installation of 100 miles of steel trolley wire, beginning as early as 1910. It is evident from earliness of this date that the introduction of steel was not a war measure, since copper was then selling around 15 cents a pound. The company put up the first steel wire simply in the hope that its lower first cost and presumably longer life would more than offset its lower conductivity. This hope has been amply justified by time, for the steel on the first lines promises three to four times the life of copper except at accelerating points. While climatic conditions on the inland lines of the Pacific Electric are unusually favorable, salt air has had no terrors for galvanized steel. Certainly the service is severe enough. The Pasadena and Venice Short Lines are really suburban rapid transit rather than interurban lines; while the San Bernardino line is the company's speediest interurban. Mr. Anderson ascribes much of the success of the galvanized steel trolley wire to so simple a cause as the maintenance of uniform tension in the current collecting equipment. The availability of oxy-acetylene for welding splices is another factor. In spite of earlier discouraging trials of steel wire in the East, the success of the Pacific Electric Railway and the prohibitive price of copper will prove strong incentives to try again with better wire and better methods. The recent purchase of 50,000 lb. of steel wire by the Los Angeles Railway is the significant indorsement of a neighbor.

FUNCTIONS OF THE ASSOCIATION MANAGER

There seems to be a growing tendency to apply modern business principles to the management of local electric railway as well as other associations. The California Electric Railway Association and the Southwestern Electrical & Gas Association are good examples of this practice. The report of the California association appeared in our issue of two weeks ago. For this reason we shall speak more particularly of what it has done, although the same general principles apply to the Southwestern association as well.

Perhaps members of other associations who read this report marveled how so much could be done in so short a time and in a state practically as big as New England, New York and Pennsylvania combined. The secret lies in the method of organization for work. Instead of assigning to each task a group of active operating men, who often prove inactive as committeemen, the California association picked out an experienced railroad man who serves with the title of manager and receives instructions from and reports to the executive committee. Thus, when the association wanted jitney statistics, it did not rely upon haphazard voluntary co-operation, but rather upon having its manager make the gathering and co-ordinating of such data his chief business. If an injurious measure is before the Legislature, the individual members of the association do not work at cross purposes, but leave to the manager the duty of placing before the legislators, frankly and openly, the reasons why the measure should not pass.

Again, if one of the member companies needs help in waging some local campaign the manager may be available for several weeks' service. In sum, the California way is to leave as little as possible to the volunteer system of meetings with its frequent postponements, large percentage of absentees and high expense for traveling and time. The work is centered in a professional, so to speak, who is familiar with all sources of data, who is untrammeled by the nightmare of local conditions, and who for the time being has no other object in life than to see that the California electric railways get their honest due.

For the same reasons that the city manager plan conduces to effectiveness in municipal affairs, the association manager plan should be effective in its field, but it requires extraordinary foresight in selecting the manager.

BECOMING BETTER ACQUAINTED WITH THE POWER PLANT

In connection with its campaign for economy in the generation and use of energy the ELECTRIC RAILWAY JOURNAL had occasion, a couple of weeks ago, to recommend that platform men and others be introduced to the power plant as far as possible. In making this recommendation it was realized that to carry out the fundamental idea underlying this suggestion something more than a mere hurried inspection trip through the plant is necessary. A modern power plant is such a complicated energy-generating machine that the lay visitor is apt to obtain but a confused, superficial and transient notion of what it is all about.

The task of giving the visitor a comprehensive idea of what a power plant is doing is simplified if his attention is directed to the routes of the several materials which pass through the plant in the course of its operation, making this term broad enough to include electricity, fuel, air and water. Such a plan has been followed in the article on the new Essex power plant of the Public Service Electric Company appearing elsewhere in this issue. This procedure not only enables one to grasp the relation of the different pieces of apparatus in the plant but also assists in visualizing the energy transformations, losses and possible savings. Take, for example, the circulating water for the condensers. It is obvious that this water must be screened to remove debris, it must be pumped through the condensers, the condensers must be arranged so it will come into intimate contact with the tubes containing the steam, and it must be discharged where it will not heat the incoming water. It is also apparent that all of the heat taken away from the plant in the circulating water is a clear loss, although, sad to relate, it is a necessary loss. Take, for another example, the air used in the combustion of the fuel. In the Essex plant a part of the air is first washed, cooled and moistened before it is drawn through the electric generators. Here it takes up most of the heat wasted in the generators, and then, supplemented with the necessary additional volume, is forced into the boiler furnaces. Here the greater part of it combines with the constituents of the fuel, producing intense heat, most of which is absorbed by the water in the boiler and superheated tubes. From the furnace the resulting assorted gases pass through the economizers, giving up a part of their heat to the feed water, and aided in their rush for the stacks, if necessary, by the induced-draft fans. As they leave the stacks the gases take away another considerable fraction of the energy originally available in the coal, a source of waste which, like that in the circulating water, will always be with us.

THE 6-CENT FARE A NATIONAL ISSUE

It becomes more apparent every day that if the 6-cent fare campaign is to be a success, it must receive the participation of electric railway companies generally throughout the United States. It is inconceivable that the 6-cent fare should be charged in a third or a half of the cities of the country and a 5-cent fare in the others. It is true that there are now 3-cent fares in some cities, but they were granted under such exceptional conditions as hardly to create a precedent in other places. If now, however, the 6-cent fare should be granted, there would be tremendous pressure to bring it down again, unless a similar rise should be achieved generally throughout the United States.

There will be a political campaign next fall. It will be more municipal in character than state or national. The development of this electric railway fare question will give every city demagog in the country a chance to become violent in his denunciation of street railway companies and a chance to create fictitious issues. That situation must be met very candidly and frankly. It becomes all the more necessary that the public itself should be made to understand that an increase in fares is in the public interest. Only by doing so will the public stand for the increase which is asked.

Even if commissions grant some of the requests for increased fares, the fight is apt to be passed on to the various state legislatures. We doubt not that if requests for increases should be acceded to, many state legislatures would try to take away the power of commissions to grant just such increases. It will be remembered that in spite of the fact that many commissions had the power to say what the charges for passenger fares should be, many state legislatures have passed laws restricting steam railroad passenger fares to 2 cents a mile. That is a danger which undoubtedly confronts the street railway business and must be borne in mind in all that is said and done.

This question cannot be settled with reference to the needs of any one company. In many cities there are several companies, and the financial condition of these different companies varies. An increase in fares may be profitable to one of these companies and yet in another case barely make it possible for the company to live. Yet it is inconceivable that increases should be granted on certain lines in a city and not on other lines in the same locality.

The settlement of this issue is going to require the highest statesmanship of the public service commissions of the various states. Great courage will be required on their part to deal with it. There will be widespread popular clamor, though we predict that that clamor will slowly but surely subside in vociferousness. The fact cannot be escaped that 6 cents' worth of service cannot be given indefinitely for 5 cents.

As we see it, there are two fundamental facts in the situation which must be laid before the public candidly and persistently. The first is that the street railway of to-day is a very different kind of road from that on which the 5-cent fare basis was originally established, and that an increased fare is warranted in the public interest if the companies are to be permitted to keep up with the progress of the railway art. The second is that the cost of doing all business is now very much increased over what it was even a few years ago and that this new basis of costs promises to be fairly permanent. At any rate, the public, through its commissions and through the exercise of an enlightened public opinion, always has the opportunity to cut down the fares granted, should it be found that increased rates provide excessive profits.

It seems to us that the companies should bring continuously to the attention of their individual constituencies that the real point of importance is that the companies must be enabled to give a constantly improved service. Unless the public shows a disposition to be willing to pay for that improved service every inducement to provide it is automatically withdrawn.

The public need have no fear of its inability to protect itself from taxation through any unusual profits which might be derived from a slight increase in the individual fares.

The electric railway business is undoubtedly at the parting of the ways. The campaign may be long; it will certainly be arduous, for the opposition will be bitter in appearance even if not in fundamental fact. But the operation of the economic laws which now compel the actual payment from somewhere of the increased cost of the improved service now being given to the people of the United States can no more be circumvented than can be the operation of the laws of gravitation.

But the vital necessity is that every electric railway in the country be alive to the situation and take immediate steps to bring the condition to the attention of its local authorities. It is not a local issue; it is a national issue, for it involves the welfare of every community in the United States which is being served by electric railways.

PUBLIC SERVICE COMMISSIONS exist not only for the protection of the traveling public, but also for the protection of the investor in public utilities. The duty of the commission both to the rider and to the investor clearly points to the need for specific action without delay.—PROFESSOR CONWAY *on the need for higher carfares in New York State.* (*See page* 1045 *of this issue.*)

Successful Use of Steel Trolley Wire by Pacific Electric Railway

The Present High Price of Copper, the Electric Railway's Staff of Life, Makes This Account of Timely Interest—About 100 Miles of Steel Wire Have Been Put Up by This Railway Since 1910 for Both Inland and Coastwise Lines of 600 or 1200 Volts and Direct or Catenary Suspension

By S. H. ANDERSON
Electrical Superintendent Pacific Electric Railway, Los Angeles, Cal.

WHEN the Pacific Electric Railway put up its first steel trolley wire on Feb. 20, 1910, we had no thought that five to six years later the price of copper would soar to such heights as 40 cents a pound. We simply felt that even with copper at 15 cents, it was worth while for us to experiment with steel as a substitute. As we have been told that our experiment has proved more successful than most others, we shall try to tell all that we have done and learned in this work, assuming that our fellow railway officials are anxious to try some 12-cents-a-pound steel in preference to 40-cents-a-pound copper.

To begin with, the Pacific Electric Railway has now in service of widely divergent character about 100 miles of No. 0000 double-grooved Roebling steel wire.

WIRE PUT UP SEVEN YEARS AGO STILL IN USE

The first steel wire was put up on the south-bound local track of the Pasadena Short Line between Oneonta Junction and Sierra Vista, a distance of some 4500 ft. on a slight down grade. This was 600-volt direct suspension. This first wire was not galvanized, and it was butt-welded in the factory. Later, wire was ordered galvanized, the idea being that if the upper part of the wire was kept from being pitted by corrosion, moisture would have no damaging effect on the wire.

Considerable trouble was first experienced on account of the wire parting at the factory splices and a lap weld braze of 70 per cent section was made at the factory in place of the former butt weld. This eliminated considerable but not all of the trouble and it was necessary to devise a satisfactory means of welding the wire on the job when breaks occurred. The method is described later.

Seven years' service is a pretty fair test period on a line with three to four-minute train service during rush hours. The presence of two long curves on the pioneer section gave opportunity also to study side wear.

A recent inspection showed this wire to be in first-class condition on the whole. It had a smooth, polished surface on the underside, but no signs of wear were apparent at the clips, switch points or splices, contrary to the condition with copper trolley wire. Since the copper and splice at both ends of the steel wire had been renewed twice since 1910, and as the steel is good for at least four or five years more, the life of steel on tangents should be three to four times that of copper. However, at accelerating or feeding-up points we do not expect steel to last longer than copper, if as long. At this writing more than 60 per cent of the Pasadena Short Line, or 20 miles, is wired in steel.

EXTENSION TO 600-VOLT CATENARY SERVICE

On May 17, 1912, we installed 4800 ft. of steel trolley wire on the inbound track of the Venice Short Line running west from Hauser. This is a high-speed catenary interurban line with three to four-car train service, and runs to the seashore. The section considered has an average grade of 0.2 per cent and contains quite a pronounced curve.

Inspection made a few months ago shows the following: On the tangents, where the service is the fastest, the original vertical diameter of the wire has been worn about 13 per cent; at the clips of the hangers, 22 per cent. The estimated future life on the tangent is three years. On the curve, the diameter has been reduced 22 per cent in the run and 29 per cent at the clips, and the estimated future life here is two years.

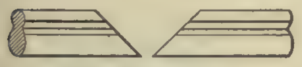
For about 500 ft. of the tangent beginning where the curve ends, as shown in the accompanying plan, the wire

VIEWS ON SAN BERNARDINO LINE OF PACIFIC ELECTRIC RAILWAY SHOWING OVERHEAD CONSTRUCTION WITH STEEL CONTACT WIRE was worn to approximately 58 per cent of its original diameter. This 500 ft. was renewed in March of this year. This rapid wear has confirmed our conclusion that, because of the heavy arcing at accelerating points, the wear of steel is as great as or greater than copper.

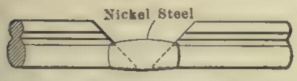
LATER INSTALLATIONS ON 1200-VOLT LINES

As galvanized steel trolley wire was giving us satisfaction right along, we kept on installing it until we have now approached the 100-mile mark. Perhaps, the most important installations are on our famous "Orange Empire" lines, the San Bernardino-Riverside line, 10 miles long, and Riverside-Corona line, 14 miles long. On these routes, long trains are operated at speeds of 60 to 70 m.p.h. The smaller current taken on this 1200-volt line produces less burning than on the 600-volt lines.

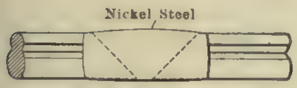
So far as we are able to determine, trolley wheels do not wear out any faster under steel than under copper. However, we believe that the chief reason for our success is that 75 per cent or more of the cars under this wire are equipped with pneumatic trolley bases which keep the tension absolutely constant to our standard of 35 lb.



Showing Two Ends Prepared for Welding



Weld Half Completed



Finished Weld

THREE STAGES IN WELDING STEEL CONTACT WIRE

Of course, the lower conductivity of steel makes necessary a larger number of feed-in points. On the San Bernardino line where we have 600,000 circ. mil of copper and the steel messenger in parallel with the trolley, the feed-ins are 450 ft. apart. Each tap consists of thirty-seven strands of No. 12 copper clamped to the messenger, carried down to the trolley wire and secured thereto with four-screw bronze ears. We figured that on this line with any one substation out of service the maximum drop with copper would be to 500 volts and with steel to 422 volts. For direct suspension, we are gradually installing a tap at every other pole, that is, about 220 ft. apart.

Generally speaking, the maintenance on steel trolley is far below that of copper, since steel is much harder. The clips hold much better in the grooves, and the wire does not break if the trolley pole hits a span. We have not had a single break due to crystallization at the ends of ears, splices or switches. In most cases, steel wire that has been accidentally broken and "shorted" on the rail can usually be restrung, whereas copper wire would become annealed.

The linemen state that steel is easier to pull up and that it can be handled for double the length of copper without sagging. Steel wire does not cut out on the sides when out of alignment nor does it pound flat at clips as does copper. Practically all the wear is due to burning and arcing at acceleration points.

OXY-ACETYLENE METHOD OF WELDING STEEL WIRE

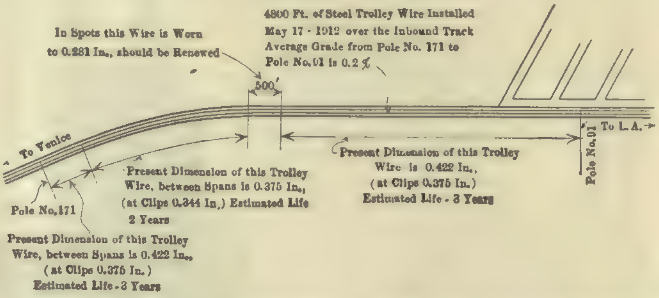
As the correct welding of splices in steel trolley wire is so important, the method developed on this system is worth description in some detail. The successive steps in making a weld are shown in the drawing above.

The equipment consists of a Prest-O-Lite outfit of gages, welding torch and tips. The torch is style H, and the size of the tip No. 5, this size being most satisfactory for our No. 0000 double-grooved wire. We first tried welding rods of Norway iron, but this led to crystallization. Our welding rods are now of 1/4-in. or 3/16-in. diameter nickel steel, which is also furnished by the Prest-O-Lite Company.

The three-part sketch shows the different stages of a weld. First the opposing ends of the wires to be joined are cut at an angle of 45 deg. and a space of 1/8 in. is left between them to provide for expansion. The flame of the torch, which is next applied, easily disposes of the galvanized scale which coats the wire.

As soon as both ends of the wire are at the melting point, the welding rod is introduced, great care being taken to keep both ends at about the same temperature. As the nickel steel is melted from the rod, it is fluxed with the steel trolley wire by means of the flame, starting at the bottom and building across and up. We found that we obtained a better application by running the welding steel around on the sides of the trolley wire; we also extended the natural top line of the wire for the sake of reinforcement but we do not regard this as essential.

As soon as all necessary metal has been added, the weld while still red hot is filed down to a smooth underrun and shaped up as much as desired. Then cold water is poured on the wire, beginning about 1 ft. on each side of the weld and running the heat toward the weld. Finally the weld is reached and wetted until perfectly cold. The average length of time to weld the wire in the air varies from ten to fifteen minutes, according to accessibility.


In Spots this Wire is Worn to 0.281 In., should be Renewed
4800 Ft. of Steel Trolley Wire Installed May 17 - 1912 over the Inbound Track Average Grade from Pole No. 171 to Pole No.01 is 0.2 %
500'
To Venice
To L. A.
Pole No.01
Present Dimension of this Trolley Wire is 0.422 In., (at Clips 0.375 In.) Estimated Life - 3 Years
Present Dimension of this Trolley Wire, between Spans is 0.375 In., (at Clips 0.344 In.) Estimated Life 2 Years
Pole No.171
Present Dimension of this Trolley Wire, between Spans is 0.422 In., (at Clips 0.375 In.) Estimated Life - 3 Years

RESULTS OF RECENT INSPECTION OF STEEL CONTACT WIRE ON VENICE SHORT LINE, PACIFIC ELECTRIC RAILWAY

BENDING, HEAT AND RESISTANCE TESTS

In conclusion, it may be of interest to mention some bending, heat and resistance tests which we made on June 24, 1912, shortly after receipt of the galvanized wire. The bending test showed that the wire could stand six right-angle bends in a vise before breaking on the seventh bend.

To find how much heat could be withstood and how much current could be carried, alternating current was passed through the wire until it was red hot. After cooling, the wire was found to be more flexible but still tough enough for use as trolley wire. It was given ten right-angle bends without breaking. Upon this direct current, averaging 750 amp., was passed through the wire for five minutes. At the end of this time it was heated to a cherry red and the galvanizing had burned off, but the wire was otherwise uninjured. This latter test proved that under normal service conditions the wire would not be damaged by high temperature. However, even if the galvanized coating was burned off by some heavy ground, this would not be so bad as the annealing of grounded copper. We calculated that the current-carrying capacity of this wire was just within the limits of the demand of our heaviest freight trains.

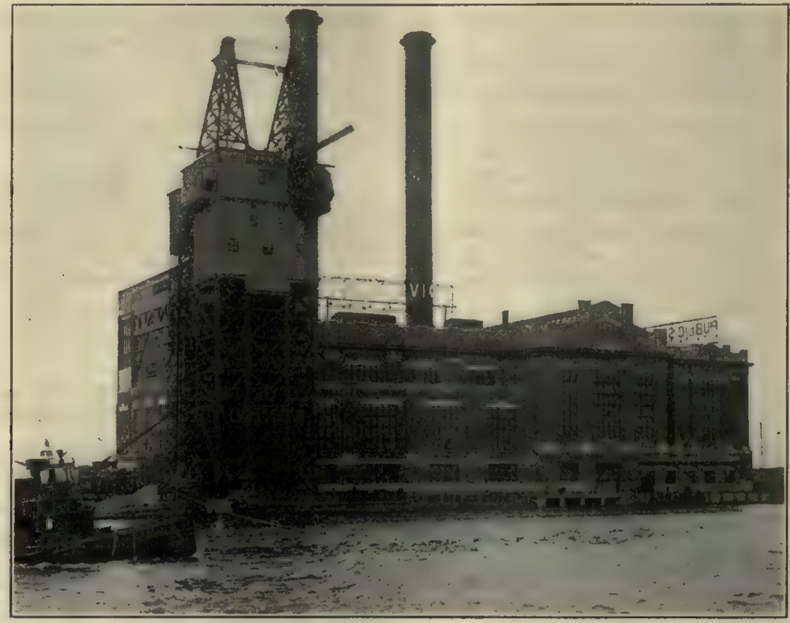
Our third test was to determine the resistance of the wire. Volt-ampere readings showed the resistance to be 0.000342 ohm per foot at 100 deg. Fahr., or 6.53 times the resistance of No. 0000 copper at 100 deg. Fahr. As the steel is 10.6 per cent lighter than copper, its resistance per unit of weight is 5.83 times that of copper.

Main Entrance to Essex Station

New Source of Power for Public Service Railway

The Essex Power Plant of the Public Service Electric Company Furnishes an Excellent Example of the Latest Steam Power Plant Practice—In This Article the Routes of Fuel, Water, Air and Electricity Through the Plant Are Traced

THE Public Service Railway and the Public Service Railroad, the headquarters of which are at Newark, N. J., purchase their power from the Public Service Electric Company. The electric company has seventeen power houses well distributed over the State, having a total capacity of about 200,000 kw. As the demand for railway and other power increased it has proved to be desirable to add a power plant which should embody the latest practice in order that energy may be generated at the lowest possible cost. This involved first a site which would have facilities for securing coal both by rail and water, an ample supply of circulating water for condensers, an area large enough for a substantial coal storage and a location from which power could be distributed all over the system with minimum loss. Such a site was found on the Passaic River about 2½ miles east of the business center of Newark, and midway between it and the Marion power plant of the company. The Essex plant was designed for an ultimate capacity of about 200,000 kw., but the layout provided a gradual evolution on the unit system in such a way as to permit economical operation from the start. How this was done will appear from a study of the illustrations accompanying this article.



NEW PUBLIC SERVICE POWER PLANT—VIEW FROM PASSAIC RIVER SHOWING COAL-HANDLING STRUCTURE, BOILER HOUSE, TURBINE ROOM, SWITCH HOUSE AND SCREEN HOUSE

General Layout of the Plant

The plant consists of four main sections; the turbine room, the boiler house, the switch house, and the coal bunkers and coal-handling equipment. The turbine room at present contains two 25,000-kva., 13,200-volt, 60-cycle, three-phase General Electric turbo-alternators. A 35,000-kw. unit of the same type is in process of installation, while a 50,000-kva. unit has been ordered for delivery in 1919. The turbine room is unusually spacious, as provision has been made for turbine units much larger than those now installed. All of the turbine auxiliaries are located below the main turbine room floor, which is thus left unusually free of obstructions. The absence of switching apparatus in or adjacent to the turbine room also conduces to the general appearance of simplicity.

The boiler house is contiguous to the turbine room and is laid out on the unit system, with the firing aisles at right angles to the axis of the turbine room. Each row of boilers contains four 1373 hp. (*i.e.*, 13,723 sq. ft. heating surface) cross-drum B. & W. boilers of the marine type. Under each is a sixteen-retort underfeed Sanford Riley stoker, the largest yet built. In the basement below the boiler floor are the forced-draft blowers, one for each boiler, the ash-handling apparatus, and the boiler auxiliaries. Above the boiler floor are the economizers of B. F. Sturtevant make, eight in number. These have each a heating surface of 7750 sq. ft. Two steel stacks are in place at present, having a height of 250 ft. above the grate and an inside diameter of 16 ft.

The switch house contains six floors, and it is separated from the main building by a space 25 ft. wide. The two buildings are connected by a bridge. On the lowest floor are generator main oil switches with auxiliaries, lightning arresters, transformers and switching apparatus for the power-house 440-volt service, and a cable testing outfit. The next two floors above are principally occupied with reactance coils, storage batteries, and sundry switching apparatus. On the fourth floor are feeder and other oil switches and the electric kitchen, dining room and general offices. On the fifth floor are the group buses, more oil switches, conduits for the control circuits and more offices. The control room, with bench boards and instrument panels arranged on the radial plan, is on the top floor, as are also the offices of the load dispatcher and the station electrician. The generator buses with aluminum cell arresters are also on this floor.

At the northeast corner of the main building is the double coal tower, behind which is a coal bunker structure having V-shaped bunkers with axes set along the line of the boiler-room firing aisles. The double tower is 215 ft. high, and is equipped at present with one 600-hp. electrically-driven hoisting engine operating a 2-yd. clam-shell bucket at a hoisting speed of 1300 ft. per minute. The tower is complete for a double equipment of this kind and the second hoisting unit will be added in the near future. At the present time coal can be taken from a barge at the rate of 180 tons per hour and this rate can be increased by the use of a larger bucket, for operating which the equipment has ample capacity. From the tower the coal is transported to the bunkers on a Robins conveying belt.

With the general plan of the Essex plant in view, the routes of the several materials involved in its operation may readily be traced. These will be taken up in order as follows: Coal and ashes, from barge to dump; circulating water from the river and back again; the water steam circuit; air and flue gases from source to stack outlet, and finally the electrical circuits.

FROM BARGE TO ASH DUMP

As the coal is elevated from the barge it is dumped from the buckets into a hopper projecting from the side of the tower, clearly visible in the general view of the station, thence it falls by gravity into the crusher, and onto the belt conveyor already mentioned. The hoist is driven by an induction motor and the properties of the latter are used in forcing it to pump back power into the line when the bucket is descending. The main coal bunkers hold about 2000 tons and they are tapped into a 15-ton Robins weighing larry traveling in each firing aisle. The coal is weighed as it is drawn from the bunkers and the loss of weight is also noted as each boiler hopper is charged, thus furnishing a check on the coal consumption. Each hopper holds about 7 tons.

The stoker drive for each firing aisle consists of four 12-hp. four-speed motors, two of which drive jackstaffs, while two drive through Reeves conical variable-speed transmissions. The driving speed can be varied between 32 to 290 r.p.m., corresponding to coal feeds of 1600 and 15,000 lb. per boiler per hour.

From the furnaces the ashes are tapped into small cars running on an industrial railway below the boilers and hauled by storage-battery locomotives. For some time to come the ashes will be distributed in the vicinity of the plant, where the land lies quite low. It is planned to fill it in to a depth of 4 ft. so as to furnish a coal storage space well elevated above tidewater. Eventually it is planned to utilize a considerable area for coal storage by means of a gantry crane. For the present a locomotive crane is being utilized to load and unload cars both for emergency coal supply from the adjacent railroad and for temporary storage.

ESSEX POWER PLANT DATA

Generating Capacity—1917, 50,000 kw.; 1918, 85,000 kw.; 1920, 135,000 kw.; ultimate, 200,000 kw.

Dimensions of plant as shown in general view:
Boiler House, 166 ft. x 116 ft., 106 ft. high.
Turbine Room, 167 ft. x 90 ft., 113 ft. high.
Switch House, 70 ft. x 117 ft., 95 ft. high.

Boilers, eight in number—13,723 sq. ft. of heating surface. Pressure 225 lb. per square inch, superheat 100 deg. to 150 deg.

Furnaces—Grate area, 200 sq. ft., ratio to h. s., 1:63½. Stokers, 16-retort, underfeed type, electrically driven.

Economizers—Eight in number, 7750 sq. ft. of heating surface, 56 per cent that of boilers.

Generating and distributing voltage—13,200.

ROUTE OF THE CIRCULATING WATER

Circulating water for the condensers is taken in from the river through three intake tunnels each of cross-section 9 1/3 ft. x 8 ft. It passes through motor-driven revolving screens located in the screen house shown at the right in the general view, thence to the condensers through centrifugal pumps, each of 24,000 gal. per minute capacity, of which there are two for each unit, one motor driven and one turbine driven. Normally the turbine pump is operated but the electrically-driven pump is automatically added whenever the temperature of the discharge water rises above a given limit. Westinghouse surface condensers are hung directly below the turbines, rigidly connected thereto and supported on springs. Each of these contains 6434 1-in. tubes 12 ft. long, giving an area of 1.28 sq. ft. per kilowatt. The condensers are of the two-pass, radial-flow type. The discharge from the condensers passes out through two discharge tunnels 12½ ft. x 9 1/3 ft. in section which rest on top of the intake tunnels.

HOUSTON LY
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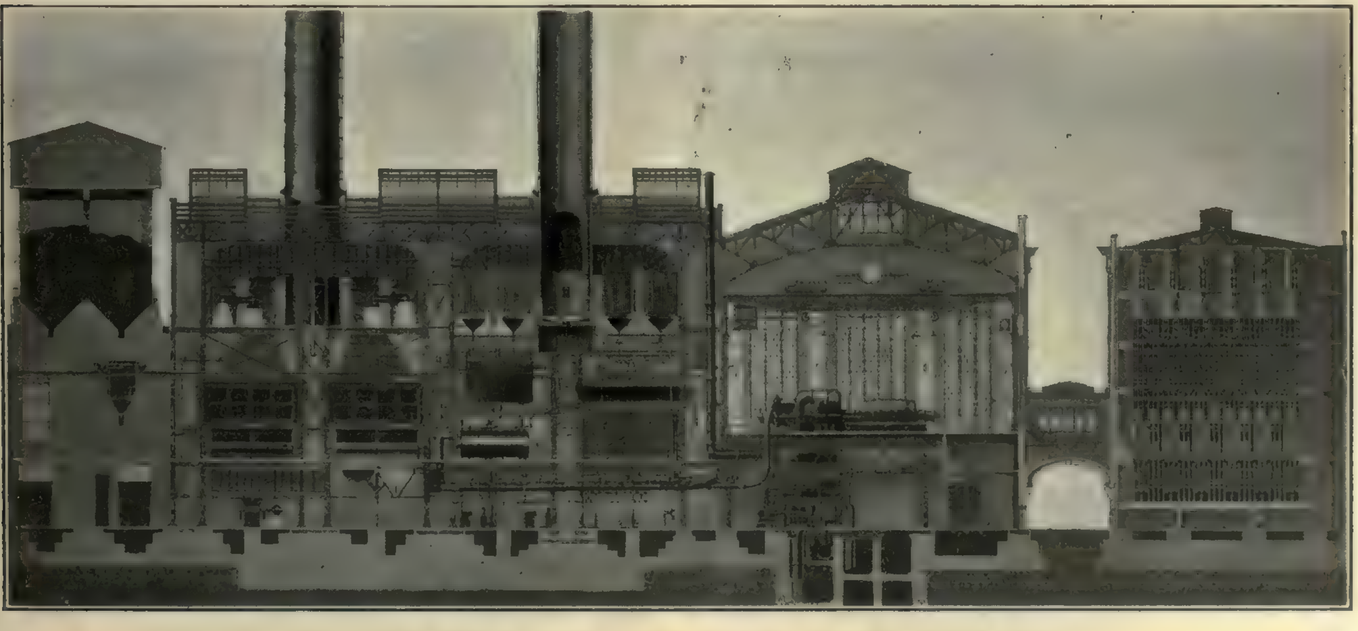
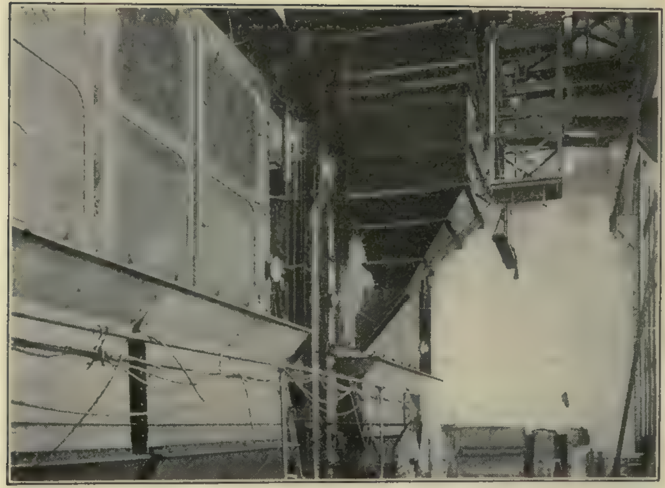
TON, TEXAS

THE WATER STEAM CIRCUIT

From the storage tank where the condensate is collected and make-up water added the feed water first goes through two Cochrane open, metering, feed-water heaters, thence to the boiler pumps which it reaches at a temperature of about 164 deg. Fahr. The boiler feed pumps are turbine-driven and, by means of a Foster



NEW PUBLIC SERVICE POWER PLANT—SECTION THROUGH ENTIRE PLANT



NEW PUBLIC SERVICE POWER PLANT—CONSTRUCTION VIEW IN BOILER ROOM SHOWING WEIGHING LARRY

NEW PUBLIC SERVICE POWER PLANT—25,000-KVA. TURBO-GENERATORS, PRESENT EQUIPMENT OF TURBINE ROOM

regulator, a constant difference is maintained between the feed-water pressure and the steam pressure. A Copes feed-water regulator is also used to maintain the proper water level in each boiler. From the pumps the water passes through the economizers which raise its temperature to 244 deg. Fahr., at which temperature it is fed to the boilers.

From the boilers the steam flows to the turbines at 225 lb. per square inch pressure through headers and cross-connected steam lines, laid out to give as direct service from boilers to turbines as possible and yet to provide for emergency routes for the steam. The boiler superheaters raise the temperature from about 100 deg. superheat at normal load to 150 deg. at 300-per cent rating, to which they are designed to be forced.

From the condensers, in which a 28¾-in. vacuum is maintained, the condensate is removed by turbine-driven hotwell pumps which deliver it to large surge tanks through V-notch meters. The air in the condensers is removed by LeBlanc hurling air pumps, motor-driven, one for each unit. Each of these requires a 100-hp. motor.

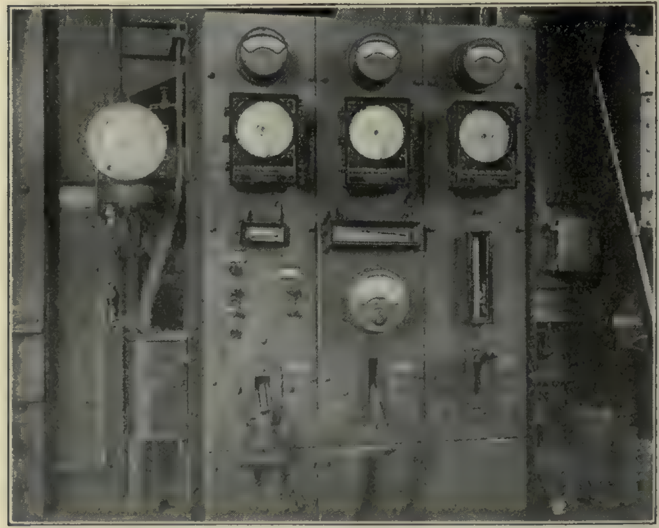
Route of the Air and Other Gases

As the boiler air supply comes in part through the electric generators it will be necessary to trace this air from the point where it first enters the plant. Before passing to the generators all air goes through washers of the spray type built by the Spray Engineering Company, being drawn through these by the fans on the generator fields. On coming from the generators the air is directed into the stoker fan rooms where there is for each boiler a 150-hp. Sturtevant multivane fan, capable of delivering 60,000 cu. ft of air per minute against a 7-in. water pressure. The air supply is controlled by a Mason regulator. While each boiler has its own fan, all of the fans in one row discharge into a common duct provided with dampers to permit adjustment of the fan capacity to the demand.

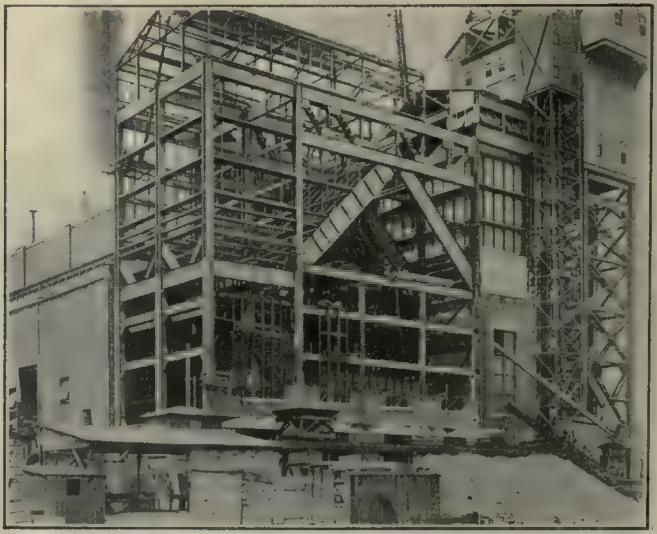
On leaving the boilers the gases may be directed to the stack by one of three routes. They may go direct to the stack, through the economizers to the stack, or through the economizers and the induced-draft fans to the stack. Dampers are provided to permit ready adjustment of the flue operating conditions to the demands of the load. The induced-draft fans, four in number, are each of 100,000 cu. ft. per minute capacity, against a 2-in. suction at the entrance to the economizers, requiring each a 100-hp. motor.

The Electrical Circuits

The electrical circuits in the plant can be considered in three general groups, one the 13,200-volt circuits from generator to feeder line, the second the low-voltage alternating-current circuits used for the power plant motors and lighting, and finally the direct-current circuits used for reserve excitation, control circuits, locomotive battery charging, etc.



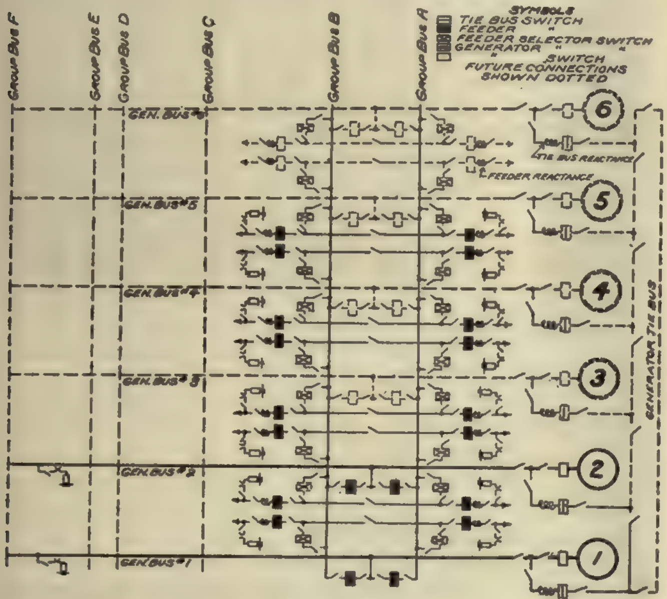
NEW PUBLIC SERVICE POWER PLANT—CONTROL AND MEASURING APPARATUS FOR ONE BOILER



NEW PUBLIC SERVICE POWER PLANT—CONSTRUCTION VIEW SHOWING COAL BUNKER STEEL WORK

To begin with the generators, it should be noted first that each of these has a continuous volt-ampere capacity rating of 25,000 kva. and generates at 13,200 volts. The speed of these machines is 1800 r.p.m., and they are equipped each with a 100-kw., 250-volt direct-connected exciter.

The general arrangement of the electrical apparatus on the six floors of the switch house has already been mentioned. The scheme of connection of this equipment is as shown in the accompanying electric circuit diagram, in which the important pieces of equipment are represented by conventional symbols. The switching equipment is laid out to give the maximum of flexibility, allowing for easy transfer of groups of feeders from one generator to another, the isolation of generators or groups of feeders, and the paralleling of generators and feeders, all with minimum risk to the plant through the effects of short-circuits.



NEW PUBLIC SERVICE POWER PLANT—SIMPLIFIED DIAGRAM OF MAIN CIRCUITS

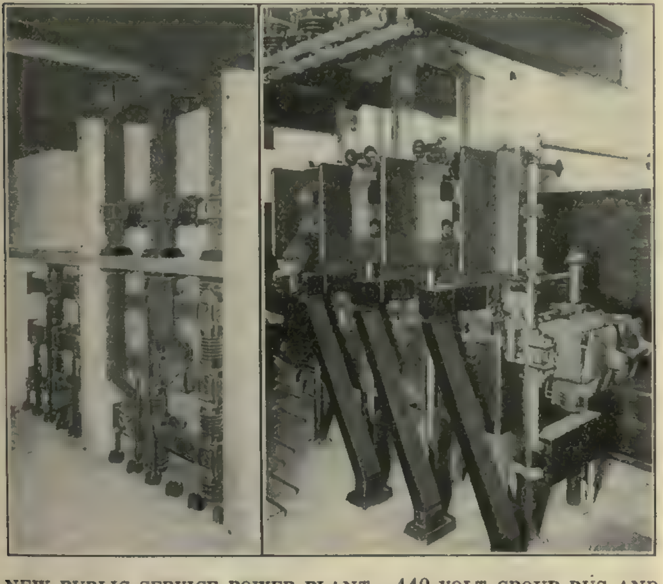
Eventually there will be six group buses with switches for connecting any one or more to any one or more generators, and there will be a looped generator tie bus for the purpose of paralleling the generators. For the present there will be but two group buses.

The route of the power from generators to feeders is this: Generator—generator switch—disconnects—bus selector switch—group bus (through disconnects on each side of switch)—feeder selector switch—feeder switch—reactor—feeder line. Between the generators and the tie bus will eventually be the current-limiting reactors shown in the diagram which will be installed this year. Electrolytic lighting arresters, with horn gaps, are installed on all feeders and also on the generator buses.

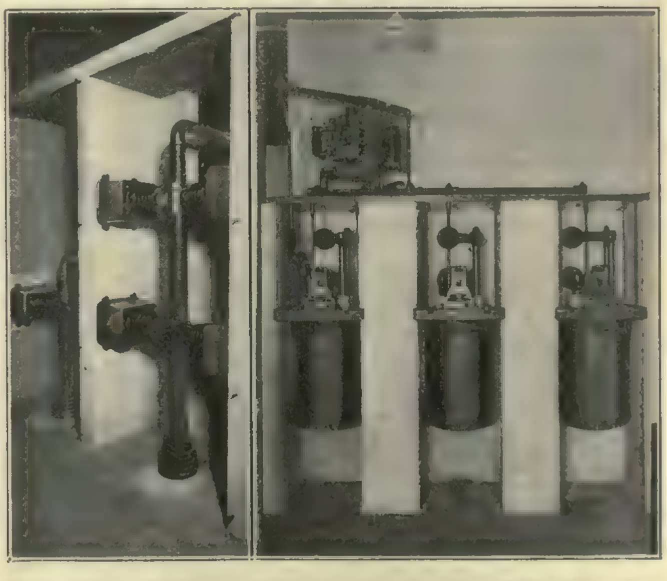
NEW PUBLIC SERVICE POWER PLANT—MAIN CONTROL BOARD ON SIXTH FLOOR OF SWITCH HOUSE

Typical views of the switching and bus equipments are shown in the accompanying illustrations. The switches are solenoid operated. The generator selector switches are non-automatic, but the others are provided with relays respectively as follows: Generator main oil switches, reverse power relays operating on full load power reversal; tie-bus switches, inverse selective overload relays with high time setting, operating only in case a short-circuit is not opened by the feeder or feeder-selector oil switches; feeder-selector oil switches, time-element overload relays to operate only in the case of the failure of the feeder-oil switch; feeder-oil switch, time-element overload relays for radial feeders and special relays for tie feeders to other power plants. The high-voltage buses are of bare flat copper, and the generator and feeder selector leads are of copper tubing insulated with cambric and braided. The switches and buses are mounted in compartments of concrete brick, special attention being given to provide unusual mechanical strength.

The excitation of the generators is normally from the exciters mounted directly on their shafts. Auxiliary to this normal supply there is a 150-kw. motor-driven exciter which can be quickly substituted for the local excitation on any machine, and in addition an exciter



NEW PUBLIC SERVICE POWER PLANT—440-VOLT GROUP BUS AND CONNECTIONS—POWER TRANSFORMER OIL SWITCH



NEW PUBLIC SERVICE POWER PLANT—BRACED GENERATOR LEAD—THREE-PHASE FEEDER OIL SWITCH storage battery is provided automatically to furnish excitation in emergency, while the spare exciter is being brought into commission.

HOUSE SERVICE POWER SUPPLY

In this plant the fullest possible use of electric power has been used for driving auxiliaries, most of which are operated by means of three-phase motors. This power is supplied through two 3000-kva. transformers, and a third will be added this year. The power circuits supply current at 440 volts. For lighting there are two 200-kva. single-phase transformers supplying current at 250 and 125 volts on the three-wire system.

"Safety Car" Operation

Importance, with One Operator, of Automatic Devices—Comparison of One-Man and Two-Man Service

AMONG the papers scheduled for presentation at the meeting of the Iowa Electric Railway Association on May 24-25 was one on "safety-car" (or one-man) operation, and the use of safety devices on such cars, by C. H. Beck of the Westinghouse Traction Brake Company. Owing to the abandonment of the convention, the facts given in the paper are released for publication by the association secretary and the author.

Mr. Beck said that automobile competition emphasized the necessity of the adoption for street railway transportation of lighter units, more frequent headway and a faster schedule. As an example of the possibilities of the light-weight safety car, the figures given in the accompanying table were presented. In this table line A is in operation, whereas line B is proposed for operation. The total car-hours per day were taken as representing 365 days of the year, because in many instances the extra service on Sunday equals the extra service on week days.

From this table it will be noted that the wages in the old service were 27 cents per hour and in the safety-car service 29 cents. The latter amount was a voluntary raise by the organization in question because of the economy effected and the desire to be fair with the operator, who contributes his share toward making such economy possible.

Present practice with the heavy cars now in use establishes 9 m.p.h. average speed as a first-class condition, and this is about the maximum that can be obtained, but with safety-car operation on a single track this figure can be raised to 10 m.p.h. with cars under as low a headway as five minutes. With switches and meeting points farther apart, the average scheduled speed could be still higher. On double-track lines, with safety-car operation, an average scheduled speed of 12 m.p.h. is easily maintained. In fact, one company, with experience with cars of this type, is proposing to operate at an average speed of 15 m.p.h. in a city where a great portion of the line is through what is called the "business district."

It should be recalled that this increase in average scheduled speed is not secured by an increase in maximum running speed or free running speed but through efficient performance of all the individual factors which pertain to car operation and movement so that the factor of safety is not decreased.

It might be considered remarkable that service heretofore performed by two men can be combined and placed under the direction of a single person and still be accomplished in less time and with greater accuracy than before. This has been well demonstrated, however, in actual practice where the car operator is provided with all labor-saving devices demonstrated as practicable. The operation of these devices involves the use of compressed air, as that is the most reliable and flexible medium obtainable for the performance of the various operations. With the old type of car and an average scheduled speed of 9 m.p.h., and average number of stops of six per mile, fifty-four stops are required per hour or practically one a minute. This means that the motorman is literally tied to the hand brake lever and has no opportunity to develop or expand his mental faculties. If this burden is removed a means for greater mental efficiency on the part of the car operator results.

	LINE A 3.32 Miles Long. 4000 to 5000 Passengers per Day. Safety Cars Now in Operation		LINE B 5 Miles Long. 8000 to 8500 passengers per Day. Safety Cars Proposed for Operation		
	Old Cars 18-Ton, 40-Passenger, Double Truck Cars	*Safety Cars* 6-Ton, 29-Passenger, Single Truck Cars	*Old Cars* 15-Ton, 26-Passenger, Single Truck Cars	*Safety Cars* 5-Ton, 30-Passenger, Single-Truck Cars, to Duplicate Old Service	*Safety Cars* 5-Ton, 30-Passenger, Single-Truck Cars, to Improve Old Service
Number regular cars in service..	3	4	9	9	10
Number extra cars in service....	3	5	2	2	5
Total..................	6	9	11	11	15
Minutes headway, regular cars..	15	10	7	7	6.3
Minutes headway, including extra cars..................	7½	5	5.7	5.7	4.2
Car-hours, regular cars........	54	74	154	154	164
Car-hours, extra cars..........	21	34	6	6	30
Total..................	75	108	160	160	194
Car-miles, regular cars.........	485	698	1470	1470	1750
Car-miles, extra cars..........	179	299	55.86	55.86	190
Total.....................	664	997	1525.86	1525.86	1940
Average kw.-hr. per car-mile....	2.41	.99	2	.7	.7
Power cost per day at 1 cent per kw.-hr..................	$16.00	$9.87	$30.51	$10.68	$13.58
Labor cost per day at 27 cents per hour, per man	$40.50	......	$86.40	......	.....
Labor cost per day at 29 cents per hour, per man..........	....	$31.32	.....	$46.40	$56.26
Car maintenance, 1.5 cents per car-mile..................	$9.96	......	......	......	......
Car maintenance, 1 cent per car-mile..................	......	......	$15.25	.....	.....
Car maintenance, ¾ cent per car-mile..................	....	$7.48	.....	$11.44	$14.55
Total labor, power and maintenance per day....	$66.46	$48.67	$132.16	$68.52	$84.39
Total labor, power and maintenance per year...........	$24,257.90	$17,764.55	$48,238.40	$25,009.80	$30,802.35
Saving per year..............	......	$6,493.35	......	$23,228.60	$17,436.05

From the viewpoint of safety, the apparatus should provide that an air-brake application occurs unless the operator holds his hand on the controller handle or performs some other conscious act. This has sometimes been referred to as a dead man's feature in the controller handle, but its use with safety-car equipment extends beyond the uses in which it was previously employed. With the modern pneumatic equipment, the brakes are applied, the sand is distributed and the doors and steps manipulated by one operation, or an emergency stop may be made in which all of these operations occur under the conditions consistent with emergency requirements, the doors and steps being either opened or permitted to remain closed but unlocked, so they may be opened by hand, as desired. These operations establish the safety car as a safer operating unit than any car heretofore in service on city lines, notwithstanding the fact that it is controlled by a single person. Time also is saved.

The foregoing remarks concern particularly the railway company and its patrons. There is, however, a more important consideration in that the entire nation is engaged in the conservation of energy and resources. The difficulty of securing men for car operation is becoming exceedingly great from day to day, and unquestionably will remain so. Moreover, the demand for men in the service of the nation becomes greater, so that the movement in favor of the safety car can properly be considered a patriotic and economic necessity.

Up-State New York Lines Need Relief

Commission Data Show That Companies Must Curtail Quantity and Quality of Service or Secure Higher Rate of Fare to Avoid Financial Disaster

By THOMAS CONWAY, JR., Ph. D.
Professor of Finance, University of Pennsylvania, Philadelphia, Pa.

EVERYONE who has made a close study of the financial results of operation of the electric railways has realized for a number of years that a radical readjustment of fares was inevitable. Many have thought that the railways have unduly delayed an effort to secure relief from the rising "cost of living" and the decreasing purchasing power of the nickel. Whatever may have been the hopes and expectations of railway managers concerning better things in the future, the outbreak of the European War and the active participation of the United States in the conflict have forced their hands.

Electric railways are at the crossroads. They must either radically curtail the quantity and the quality of service which has been rendered to the public, or secure a higher rate of fare, if they hope to avoid financial disaster. The pending and expected applications before the New York Public Service Commissions, therefore, are of the greatest importance not only to the railways directly involved, but to the entire industry. They mark the beginning of a general movement, the outcome of which will determine the future of the electric railway industry and the status of its securities.

This article will not deal with the problem of the electric railways in New York City. To demonstrate the financial needs of these companies and the inadequacy of the present rate of fare should be comparatively easy. Their affairs have been subject to continuous supervision and inquiry by the First District Commission, while most of the properties have been recently valued by the commission in connection with reorganization matters.

EARNINGS OF THE UP-STATE PROPERTIES

The up-State electric railways approach the problem under different circumstances. Practically none of these companies has been the subject of recent valuations. They operate under widely dissimilar circumstances, and the financial results of operation are not uniform. The suggestion, therefore, has come from some quarters that there is no general principle involved, and that each company must not only make its own application for specific relief but must establish that there is an unusual emergency demanding immediate action. While there is no doubt that the form of relief to be granted to the several up-State companies will differ to a great extent with individual properties, yet it is important at this stage to get clearly in mind that there is an emergency affecting all properties alike. This emergency warrants united action by the electric railways, and generous and prompt treatment by the Public Service Commission.

The financial results of operation of the up-State properties, which is the subject of this study, have been growing continuously less favorable throughout recent years. The results for each year from June 30, 1911, to June 30, 1915, inclusive, for which official statistics are available in the published reports of the Public Service Commission of the Second District, are as shown in the accompanying table.

Although gross operating revenue increased during these five years more than $4,000,000, net operating income, or the amount remaining after operating expenses and taxes had been deducted, increased only $100,000. As a result of a decline in non-operating revenue, the combined gross income of the up-State properties showed an actual decrease during this period. To earn this gross income required a continuously increasing investment which, it must be remembered, was made only with the specific consent and approval of the Public Service Commission in each and every case. Interest charges increased almost $3,000,000, while "other deductions," or rentals and interest on the floating debt, increased almost 50 per cent in these five years. The result was a most alarming decrease in net income from $4,294,000 in 1911 to $933,000 in 1915. If the figures for all the companies for the year 1916 were at hand the results would probably be even less favorable than those for 1915.

DECLINE IN MARGIN OF SAFETY PROTECTING BONDS

The decreases in net income have been most disquieting to the security holder. The margin of safety for the bonds of the up-State electric railways, figured on the conventional method—that is to say, the ratio of net income remaining after satisfying interest requirements and rentals, to gross income—has shown an alarming decline, as follows: 1911, 41.1 per cent; 1912, 39.3 per cent; 1913, 19.9 per cent; 1914, 16.7 per cent, and 1915, 9.1 per cent.

As a rough average, a margin of safety of 40 per cent (assuming proper allowance has been made for the maintenance of property) is a fair showing. When this margin of safety steadily and rapidly declines, until the gross income is less than 10 per cent in excess of fixed charges, the corporations may, without exaggeration, be characterized as in a serious financial plight. What the showing for 1916 will be, when the commission publishes its completed figures, must, to a considerable extent, be a matter of surmise. That it will be not much, if any, more favorable than for 1915 is almost certain. The showing for the year ending June 30, 1917, must be even less favorable.

LARGER REVENUES OR POORER SERVICE

Even though the entrance of America into the European struggle did not make practically certain still

FINANCIAL RESULTS OF OPERATION OF UP-STATE PROPERTIES, JUNE 30, 1911, TO JUNE 30, 1915

	1911	1912	1913	1914	1915
Railway operating revenue...	$27,041	$28,010	$30,234	$32,062	$31,127
Railway operating expenses..	16,796	17,827	19,456	20,741	20,228
Net revenue—railway operations	$10,245	$10,183	$10,778	$11,321	$10,899
Railway tax accruals........	1,442	1,535	1,784	1,961	1,991
Railway operating income...	$8,804	$8,648	$8,993	$9,360	$8,909
Other operations, net revenue.	642	660	683	735	709
Non-operating income	981	1,288	608	636	649
Gross income	$10,427	$10,597	$10,284	$10,731	$10,267
Interest charges	$5,293	$5,441	$7,009	$7,656	$8,037
Other deductions	840	981	1,220	1,338	1,296
Net income	$4,294	$4,174	$2,055	$1,737	$933

Note.—The last three figures are omitted in all columns.

higher prices, and consequently less favorable operating results, there can be no question that the electric railway officials would be recreant in their duty to the security holders and to the public were they not, vigorously and persistently, to seek relief from the conditions above disclosed. Under the conditions now confronting them, they have no alternative. They are well within the truth when they state that they must either secure a higher return or, to live under present tariffs, must make a choice, in a large number of cases, between curtailing service or facing bankruptcy.

DECLINING RETURN UPON CAPITALIZATION

The average rate of return of the up-State electric railways upon their total capitalization during each of the five years from 1911 to 1915 inclusive compares as follows: 1911, 4.87 per cent; 1912, 4.91 per cent; 1913, 4.57 per cent; 1914, 4.28 per cent, and 1915, 4.01 per cent.

If a comparison is made upon the basis of the percentage which net income—available for the payment of dividends—after the payment of interest charges, rentals and other similar deductions, bears to the total capital stock outstanding, the showing is even more unfavorable: 1911, 3.44 per cent; 1912, 3.33 per cent; 1913, 1.75 per cent; 1914, 1.45 per cent, and 1915, 0.77 per cent.

The Supreme Court of the United States has on many occasions affirmed the right of a public utility to earn a reasonable rate of return upon the fair value of its property. Surely it cannot be contended that the above average rate of return is *prima facie* adequate. Of course, the opponents of fare increases will argue that there is no assurance that the value of the up-State properties is equal to their capitalization and that a considerable part of the capital stock is not represented by assets. It must be emphasized, however, that there is no proof of the gross overcapitalization of these companies, and that, on the contrary, there is much evidence to substantiate the existence of original value behind a good proportion of the outstanding capital stock.

It is important in this connection to note that the entire increase in capitalization of the up-State companies in the five years covered in the foregoing comparison has been in the nature of funded debt. The comparative amount of stocks and bonds outstanding in each year and the proportion which the funded debt bears to the total capitalization is as follows:

Year	Total Funded Debt	Total Capital Stock	Percentage of Funded Debt to Total Capitalization
1911	$89,197,100	$124,741,975	41
1912	90,723,100	125,216,742	42
1913	107,622,100	117,058,230	47
1914	131,220,025	119,517,230	52
1915	135,117,990	120,326,085	52
			Per cent increase or decrease
Increase—			
1911-15	45,920,890	......	51
Decrease—			
1911-15	......	4,415,890	4

GROWING DISPROPORTION OF BONDED DEBT

Experience points to the necessity of preserving a proper relationship between bonded debt and capital stock. The bondholder is a creditor who, in return for a low interest rate, demands protection against the risks incident to the operation of the business. The stockholder assumes the risk in expectation of a higher rate of return. One of the most disquieting features of the recent history of electric railways in the Second District of New York—in fact, throughout the country—has been the steady increase in the proportion of the total capitalization represented by funded debt. The same tendency has existed for some years in the case of the railroads. It means an inevitable weakening of the security for the bondholders, for the amount of capital invested by the stockholders and the income from this capital, which furnishes protection to the bondholders, is steadily dwindling. It is a matter of common knowledge to public utility operators and investment bankers that the reason for the sale of bonds and the disuse of stock as a method of financing has been that stock could only be sold upon terms which were so disadvantageous to the company as to commend them neither to the corporation nor to the public service commission.

This movement cannot continue indefinitely, even if the rate of return upon each dollar of capital invested remained as favorable as formerly. With the declining rate of return, the time has come when the electric railways, with few exceptions, find that they are able to sell bonds upon continually less favorable terms. The most serious aspect of the entire financial problem to the public is the inability of the electric railway to command new capital, which means the inability of these utilities to provide additional cars, to extend tracks as the cities expand, or in other ways to keep pace with the country's progress.

HOW LABOR COSTS HAVE INCREASED

It is not the purpose of this study to dwell at length upon the unfavorable general conditions which have brought about the financial plight of electric railways, not only in up-State New York but throughout the country. Every element of operating cost has shown a steady and alarming increase. The census of 1912 showed that 63 per cent of the total operating expenses of the electric railways of the country represented payments for labor. Substantially the above proportion is represented by the labor bill of the railways in the Second District.

The reports of the several companies to the up-State commission enable one to measure the extent of the increase in labor costs during the last few years. Most of the companies in reporting wages, prior to the year ended June 30, 1909, based their figures upon the monthly compensation paid employees. The decreasing length of the working day and the consequent necessity for a larger number of men to handle the same volume of work made a comparison upon this basis very untrustworthy. With the year 1909, therefore, the majority of companies began to report wages upon an hourly basis. If the wages for motormen and conductors of those up-State companies which reported both for the years 1909 and 1915 are compared, the extent to which this important element in the cost of operation has increased can be seen. A similar comparison might be made for other classes of electric railway employees, but the results would be substantially the same as that shown for the platform men in the table on page 1047.

The data in this table, which covers considerably more than half of the total companies operating within the Second District (all of those reporting such data for these years), are worthy of study. Only three out of the thirty-three companies listed have avoided advancing wages of motormen and conductors. Each of these companies was paying, however, relatively high wages in 1909. Four companies have advanced wages in the seven years ranging from 1 per cent to 10 per cent; seven have advanced wages from 11 per cent to 15 per cent; eight from 16 per cent to 20 per cent; three from 21 per cent to 25 per cent, while eight companies have granted advances exceeding 25 per cent of the former rates.

Official statistics are not available concerning the increases in the costs of various classes of materials

AVERAGE HOURLY WAGES OF CONDUCTORS AND MOTORMEN

	Motormen			Conductors		
Name of Company	1909	1915	% Inc.	1909	1915	% Inc.
International Ry.	$0.230	$0.291	26	$0.230	$0.256	11
Schenectady Ry.	.244	.287	18	.239	.287	20
Buffalo & Lake Erie Trac. Co.	.187	.272	45	.159	.268	68
Hudson Valley Ry.	.220	.280	27	.220	.280	27
Yonkers R. R.	.226	.267	18	.228	.263	15
Westchester Elec. Ry. ...	.230	.268	16	.226	.266	17
Auburn & Syracuse Elec. R. R.	.205	.271	32	.205	.267	30
Western N. Y. & Penn. Trac. Co.	.180	.210	17	.180	.200	11
N. Y. & Stamford Ry....	.223	.267	20	.217	.257	18
Elmira Water, Light & R. R. Co.	.192	.211	10	.180	.201	17
Orange Co. Traction Co.	.197	.230	17	.197	.230	17
Niagara Gorge R. R.....	..	.246	..	.200	.251	25
Kingston Consolidated R. R.	.209	.233	12	.203	.226	11
Syracuse & Suburban R.R.	.192	.250	30	.183	.250	36
Cortland County Trac. Co.	.170	.190	12	.167	.190	14
Peekskill Lighting & R. R. Co.	.186	.203	9	.186	.203	9
Elmira & Seneca Lake Trac. Co.	.189	.223	18	.186	.217	17
Buffalo Southern Railway	.190	.250	31	.190	.250	31
Wallkill Transit Co.	.200	.215	8	.200	.217	8
Corning & Painted Post St. Ry.	.189	.220	16	.187	.220	16
Syracuse & South Bay Elec. R. R.	.227	.285	25	.222	.283	27
Buffalo & Williamsville Elec. Ry.	.200	.206	3	.200	.206	3
Ogdensburg St. Ry.	.155	.168	8	.154	.168	8
Troy & New England Ry.	.200	.239	19	.200	.238	19
Eastern New York R. R..	.202	.221	9	.200	.200	..
Huntington R. R.	.180	.228	26	.170	.214	25
Hudson River & Eastern Trac. Co.	.200	.200	..	.200	.200	..
Glen Cove R. R.	.180	.227	26	.170	.214	25
Buffalo & Depew Ry. ...	.150	.200	33	.150	.200	33
Rochester & Manitou R.R.	.250	.250	..	.250	.250	..
Northport Traction Co. ..	.180	.212	18	.170	.195	15
Putnam & Westchester Trac. Co.	.187	.209	12	.187	.209	12
Adirondacks Lakes Trac. Co.	.210	.280	33	.210	.280	33

which are used by electric railways. It is a matter of common knowledge, however, that there have been large increases in the cost of coal, copper, steel, crossties and the other materials extensively used by such properties. The increases of the prices of these materials has been particularly great within the last few months and is largely responsible for the present very acute situation.

RELIEF SHOULD BE PROMPTLY GRANTED

The advances in wages have been due to conditions over which the electric railways had no control. There is no assurance that the present scale of wages will represent the high point. In fact, the rapidly mounting cost of living points strongly to the possibility of further increases, involving a proportionate increase in almost two-thirds of the total operating expenses of the average electric railway. It is the duty of the electric railway to retain a skillful, experienced working force, and this can only be done by paying the wages which such employees can secure in other industries.

It is largely because operating expenses will greatly increase in the immediate future that the electric railways are now asking for emergency relief. Such relief should be promptly granted. Valuations will require a period of several years, particularly in view of the fatc that practically all of the properties must be valued at the same time. If years elapse before relief is granted, the credit of the electric railways will be destroyed or seriously impaired. It should be kept in mind that the public service commissions exist not only for the protection of the traveling public, but also for the protection of the investor in public utilities. The duty of the commission both to the rider and to the investor clearly points to the need for specific action without delay.

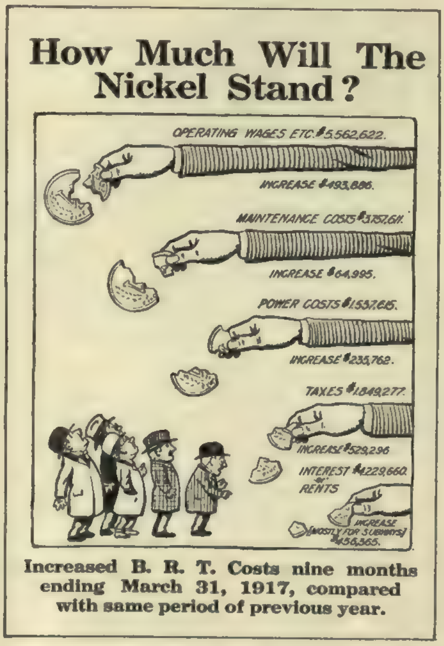
Alderman Henry D. Capitain, chairman of the local transportation committee of the Chicago City Council, has proposed that $5,000,000 of the $21,000,000 Chicago traction fund be used to purchase Liberty bonds. This was referred to the finance committee.

New York Fare Hearings Postponed

City Two-Cent Transfer Question to Be Taken Up June 18—Examples of B. R. T. Publicity

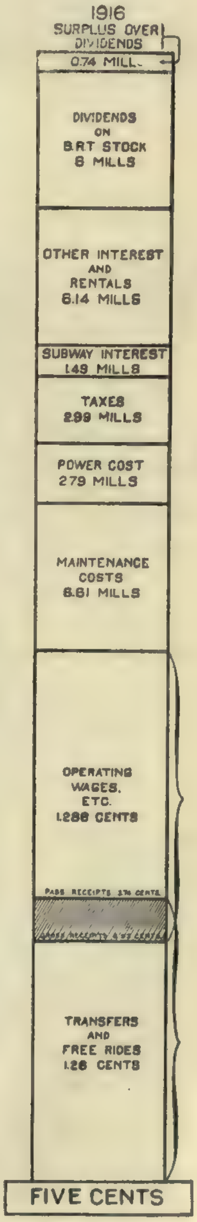
At the request of counsel the hearings upon the applications of street railway lines in New York City for financial relief were postponed from June 6 to June 18. From the appearances noted, it is evident that the companies' plea will meet with much opposition on the part of the city, civic organizations and labor unions. It is expected that each application will be taken up in turn, the Third Avenue Railway, the New York Railways and the Brooklyn Rapid Transit Company being the first three companies appearing. These railways, as before announced, have asked for a 2-cent transfer charge. The New York & Queens County Railway and the Second Avenue Railroad, whose applications were for general relief, have been directed to amend them to specify the form of relief desired.

In extending its publicity work to show the need of increased revenues, the Brooklyn Rapid Transit Company has been issuing car pamphlets discussing various phases of the situation. In one, entitled "Tearing the Nickel Apart," the illustration from which is reproduced herewith, the company discusses the various increased costs of operation shown. In another, entitled "How the Nickel Shrinks," the company used the accompanying illustration to show an analysis of receipts and expenditures per passenger in 1916. Still other recent pamphlets have been one on "Credit," showing how improvements depend on credit and credit on profits, and one on "Dollars per Minute," giving various transportation costs on a minute basis.


How Much Will The Nickel Stand?

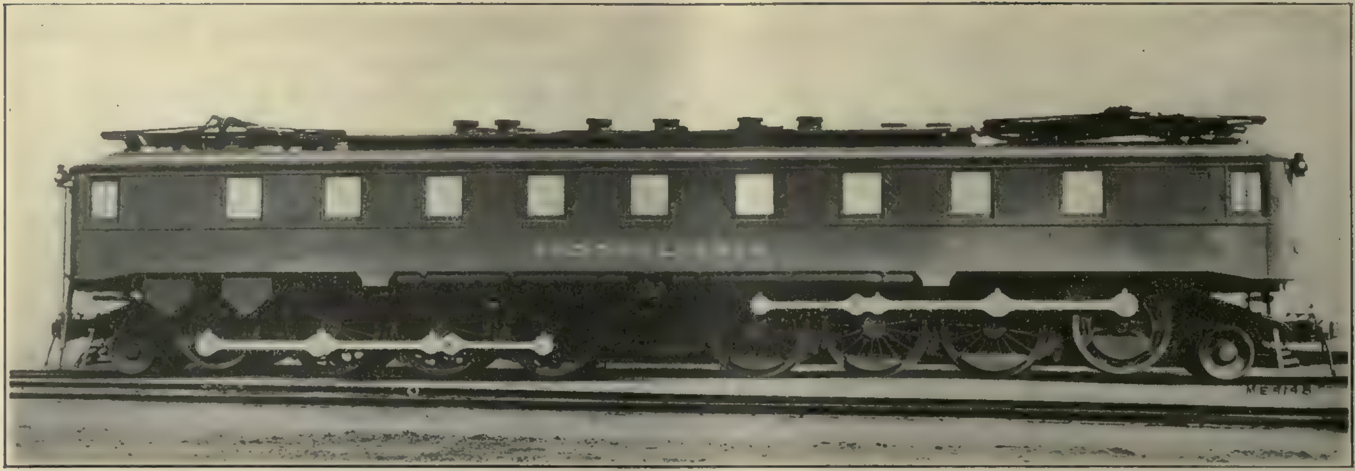
OPERATING WAGES ETC. $5,562,622.
INCREASE $493,886.
MAINTENANCE COSTS $3,757,611.
INCREASE $64,995.
POWER COSTS $1,557,615.
INCREASE $235,762.
TAXES $1,849,277.
INCREASE $529,296
INTEREST & RENTS $4,229,660.
INCREASE (MOSTLY FOR SUBWAYS) $456,365.

Increased B. R. T. Costs nine months ending March 31, 1917, compared with same period of previous year.



ILLUSTRATIONS FROM B. R. T. CAR PAMPHLETS

The "Credit" pamphlet gives the following essentials of a first-class street railway: Honest financing; high-grade construction and equipment; efficient and courteous operators; satisfactory volume of business; ample margin of profit; well-established credit, and liberal policy toward community needs.



PENNSYLVANIA LOCOMOTIVE—NEWLY COMPLETED UNIT DESIGNED FOR FREIGHT SERVICE OVER THE ALLEGHENY MOUNTAINS

Novel Locomotive for the Pennsylvania

This Latest Type of Electric Locomotive, Which Has Been Built by the Pennsylvania Railroad for Trial Service, Has a Twin-Motor, Spring-Geared, Jack-Shaft Drive with Side Rods Coupled to Three Pairs of Driving Wheels for Each of Two Articulated Trucks

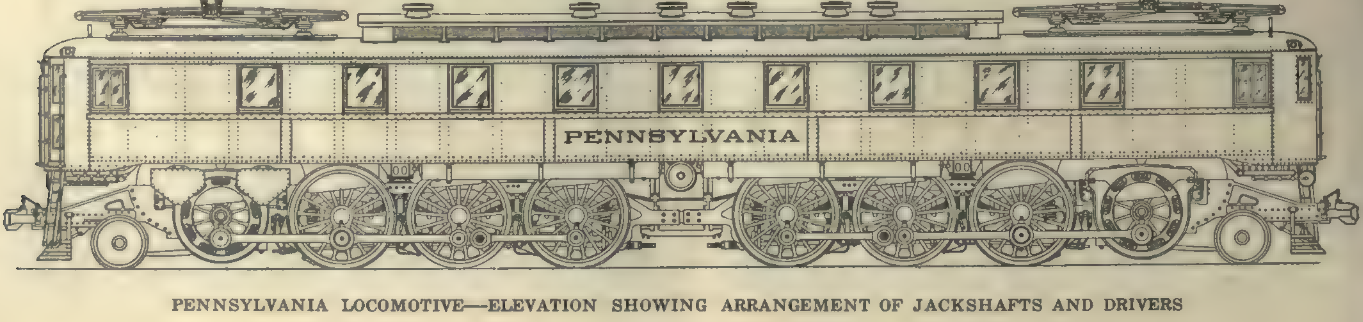
WHAT promises to mark an important step in the application of electric motive power to steam railroad service appears in the completion of a new type of electric locomotive for trial service on the Pennsylvania Railroad. The new machine, which was built at the railroad company's Altoona shops, and was electrically equipped by the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa., has been designed for hauling the heavy freight traffic over the Allegheny Mountains between Altoona and Johnstown, Pa. This run covers a distance of about 37 miles, including the famous Horse Shoe Curve, and the gradients are extremely heavy, the maximum being a 12-mile stretch at 2 per cent. The freight traffic over the division averages about 300,000 tons a day.

Opportunity for service trials on the Pennsylvania Lines exists on the Philadelphia-Paoli suburban division, which was electrified about two years ago at 11,000 volts single-phase, these being the power characteristics of the new locomotive. However, as this suburban division offers only limited chances for service tests on heavy grades and with heavy train loads, the engine possibly may be transferred later to the Bluefield Division of the Norfolk & Western Railroad for further trial. The latter road has, on its electrified division, conditions similar in many respects to those that will be encountered when the locomotive goes finally into regular service on the Pennsylvania Railroad's Altoona Division, that is to say, heavy freight traffic and steep grades. It should be noted here, however, that the Altoona Division has not yet been electrically equipped, the proposed conversion having been indefinitely postponed on account of conditions arising from the war.

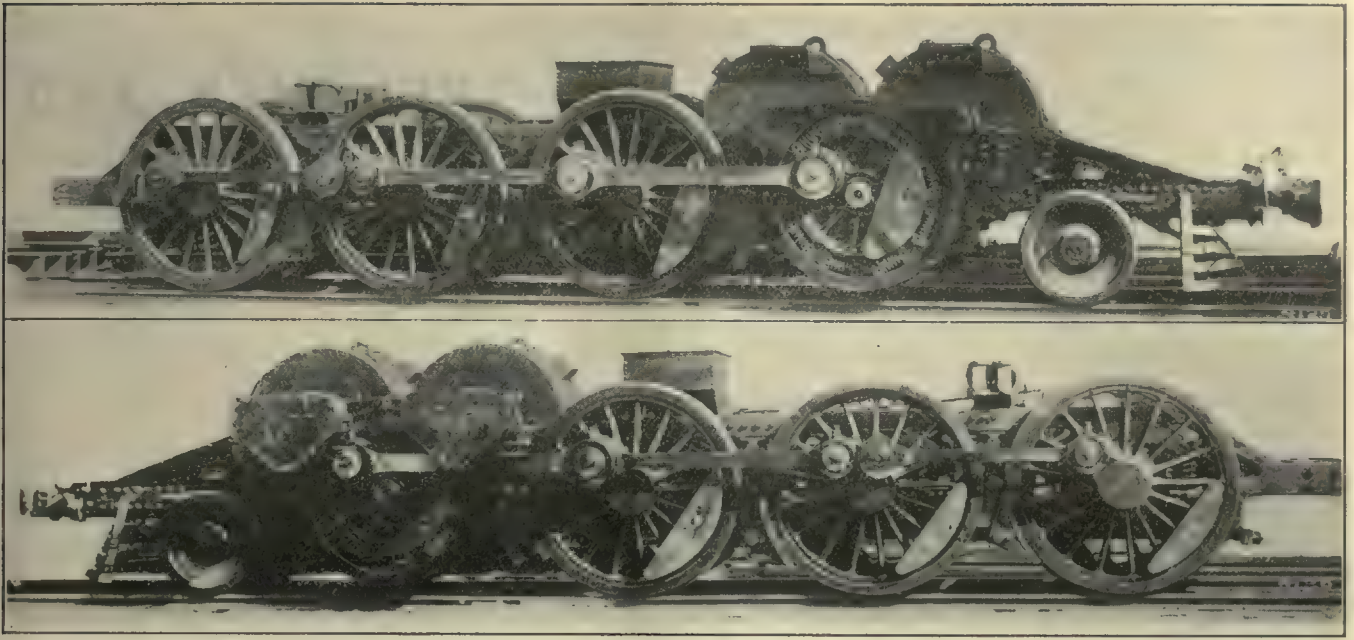
Electrically, the new engine is quite similar to the Baldwin-Westinghouse electric locomotives used on the Norfolk & Western Railroad. Energy is derived from an 11,000-volt, single-phase, 25-cycle overhead contact system through pantograph collectors. In the locomotive, the power is changed from single-phase, by means of a phase converter, to the three-phase form, and then is fed to induction motors of the slip-ring type.

There are four motors, each with a rating of 1200 hp., giving the locomotive a rating of 4800 hp. Two motors are mounted on each truck frame and they are geared to a jack shaft from which the three pairs of driving wheels are driven by connecting rods. Springs which are provided in the gears of these jack shafts are so adjusted as to give the effect of a solid gear up to a tractive effort equivalent to 25 per cent of the weight on drivers, thus producing the solid-gear effect under ordinary operating conditions. As shown in the accompanying illustrations, these spring gears, except for their great size, are of the standard type. However, the teeth are cut to a rather flat spiral, and as the gears on each end of the motor and jack shaft are cut right-hand and left-hand respectively the combined effect is that of herring-bone gearing.

A feature of the motor design, which has been planned to give the greatest possible core length for the armature, is the use of a hollow armature shaft through which leads are extended to collector rings at one end of the shaft outside of the pinions. Thus the full length



PENNSYLVANIA LOCOMOTIVE—ELEVATION SHOWING ARRANGEMENT OF JACKSHAFTS AND DRIVERS

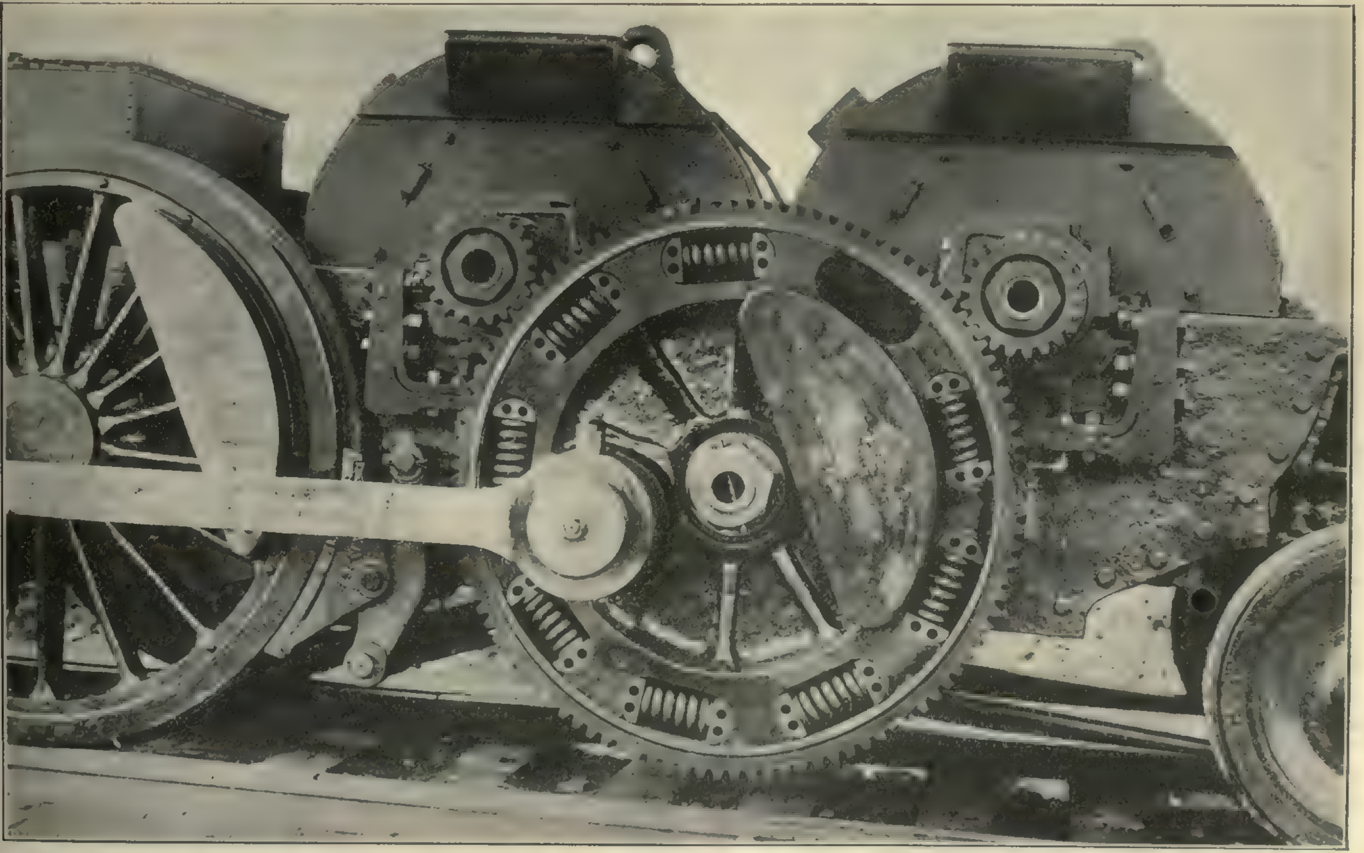


PENNSYLVANIA LOCOMOTIVE—VIEWS OF RIGHT AND LEFT SIDES OF HALF UNIT WITH CAB REMOVED

between clearance lines is utilized in the motor construction and the cost and weight of the motor are minimized.

There is provided only one normal operating speed, this being 20.6 m.p.h., obtained with the motors in parallel. This speed is the maximum that is considered safe for the heavy trains that these locomotives will be required to handle on the grades of the Altoona Division. A lower speed of 10.5 miles per hour may be obtained by connecting the motors on the same truck in "cascade," whereby the rotor windings of the two motors are coupled together with one motor's stator winding connected to the line and the other motor's stator winding short-circuited. This speed will be used only around yards and for other protracted slow movements, since cascade operation involves a low power factor. Intermediate speeds between zero and the maximum can be obtained by means of a water-rheostat control system similar to that in the Norfolk & Western locomotives, which permits a very close regulation of the tractive effort developed by the locomotive during acceleration.

Two of these engines, one pushing and one pulling, will be able to haul a 3900-ton train at 20.6 m.p.h. up the 12-mile grade of 2 per cent from Altoona to Gallitzin, and a 6300-ton train east bound up the 1 per cent grade from Johnstown to Gallitzin, a distance of 25



PENNSYLVANIA RAILROAD—VIEW SHOWING DETAILS OF SPRING GEAR AND MOTORS WITH HOLLOW SHAFTS FOR LEADS miles. The tractive effort developed at the maximum speed is 87,200 lb.

The running gear of the locomotive is quite similar in general appearance to that used for steam locomotives, the gear wheels being connected by side rods to the three pairs of driving wheels on each truck. For an electric locomotive, however, the location of the motors is unprecedented, since they are placed ahead of the three pairs of drivers, or between the drivers and the guiding-truck wheels. The spring rigging on each truck is of the three-point-suspension type, one suspension point being over the pony truck and the other two over each side frame, toward the rear. The usual equalizers are provided over each box, together with elliptical springs between journals and helical springs outside of the first and third journals.

Features of the structural details include inward projections from each gear hub to form the jack-shaft journals, the jack-shaft bearings being made up of solid bronze bushings forced into holes bored in the frame casting. The center plate of each truck is located halfway between the first and second axles at an elevation of about the height of the top frames. Between the second and third axles an auxiliary spring support for the cab has been installed for the purpose of equalizing the loads on the various drivers, or, in other words, to counterbalance the excess weight in front due to the location of motors between the pony truck and first pair of drivers. The contact between the caps over these spring supports and the bottom surface of the cab is necessarily a sliding one.

Each motor truck includes a pony truck of the Pennsylvania Railroad standard type, with an elliptical spring located each side of the axle and supported on T-links. As the usual T-links alone will not provide sufficient lateral motion, a rocker casting supported by the elliptic springs has been added. The combination T-links and rocker permit sufficient lateral motion for curves of 275 ft. radius.

Articulation between the motor trucks is effected by a construction that permits each truck to rotate around the center of its center plate without restriction. The pulling and pushing strains between drawbars carry through the trucks, as well as the articulation, in a direct plane 34½ in. above the rails, and the cab is entirely relieved of these strains.

The principal characteristics of the locomotive are as follows:

Over-all length	76 ft. 6¼ in.
Total wheelbase	63 ft. 11 in.
Driving wheelbase	38 ft. 8 in.
Rigid wheelbase	1[illegible] ft. 4 in.
Over-all width	10 ft. 1 in.
Diameter of driving wheels	72 in.
Weight on drivers	198 tons
Diameter of pony wheels	36 in.
Weight on each pony truck	21 tons
Total weight of locomotive	240 tons
Tractive effort	87,200 lb.
Speed	20.6 m.p.h
Horsepower at 20.6 m.p.h	4,800
Train load on 1 per cent grade	3,350 tons

Keeping Surface Railway Tracks Clear

THE New York Railways have sent copies of the poster reproduced herewith to heads of department stores, manufacturing establishments, trucking concerns and owners of motor trucks generally in connection with a campaign to secure co-operation in keeping the tracks clear. Some days previous to the sending out of the circulars President Theodore P. Shonts addressed letters to these men explaining the necessity for their assistance, and as a result hundreds of firms replied that instructions had been issued to drivers to keep off the car tracks whenever possible. Two of the large posters have been sent to each firm which has issued such instructions, with a request that they be displayed in shipping rooms in plain view of the actual drivers of trucks.

TO TRUCKMEN AND CHAUFFEURS

This Company is Cooperating with the City Authorities in Seeking to Improve Street Traffic Conditions.

◆ ◆ ◆

We ask you to help by keeping off the Car Tracks all you can.

◆ ◆ ◆

Street-cars must stay on the Tracks. They cannot ride around your car or truck. When the Street Car is delayed, you are causing inconvenience to the passengers.

Whenever there is room on the side of the Street

Please Don't Drive on the Car-Tracks!

POSTER USED IN NEW YORK RAILWAYS CLEAR-THE-TRACK CAMPAIGN

A British Tramway in Wartime

1100 Men Enlisted Between 5 P. M. and 9 A. M. the Next Day—3000 Men Now with the Colors—Other Activities

A LETTER that has been received in this office from James Dalrymple, general manager Glasgow Corporation Tramways, who is one of the best known and most successful electric railway operating officials in Great Britain, is published below as an illustration of the spirit displayed by our British Allies in the world's war for the ideals of democracy:

"Ever since the war started our staff has done a very large amount of war work. In September, 1914, immediately after the outbreak of war, the city of Glasgow decided to raise a number of battalions. Out of our own staff we raised a battalion of 1100 men between 5 o'clock in the evening and 9 o'clock the following morning. These men have been in France for a long time and have been doing excellent work. The city, during the winter of 1914-1915, and throughout the whole of 1915, carried on an extensive recruiting campaign, and our office here became at that time and has since remained the center of all the recruiting activity in the city.

"We have now 3000 men with the colors, and our male staff, as you can understand, is now very much depleted, especially that portion of the staff of military age.

"Early in 1915, after losing about 2000 men, we started women as conductors, and shortly afterwards we put them on the front of the cars. We have now about 300 women driving in Glasgow and about 1500 conducting. They are doing the work very well; in fact, in a short time I expect that every man available for military service will be away from the department.

"Quite recently we formed a battalion of volunteers for home defence, and this battalion is practically all composed of members of our own department. In many ways the staff of the department has assisted the military authorities. At the present moment, the whole of the military recruiting staff in the city is housed in our office here. We give them the use of the premises free.

"I think you may take it that what applies to Glasgow applies equally to the tramway staffs in every city in the kingdom. I shall be glad to hear that in America the street railway managers and their staffs are throwing themselves heart and soul into this business, so that we may get it finished up at the earliest possible moment."

Taking Care of Corner Stresses from Large D. C. Feeders

Insulators of Lignum Vitae Wood and 1½-in. Cold Rolled Steel Pins Solve San Francisco's Problem of Providing Required Insulating Qualities and Withstanding Crushing Stresses from Heavy Feeders and Heat from Overloaded Cables

By S. L. FOSTER
Chief Electrician United Railroads of San Francisco

IN the earliest days of electric street railroading with small cars, when the overhead feed wires were only No. 2, No. 1 or No. 0 B. & S., it was usually possible to get the wire safely around corners with the old standard electric light 1½-in. locust pin, bored and reinforced with a ⅜-in. carriage bolt down its center with a "deep-groove" glass insulator screwed upon it.

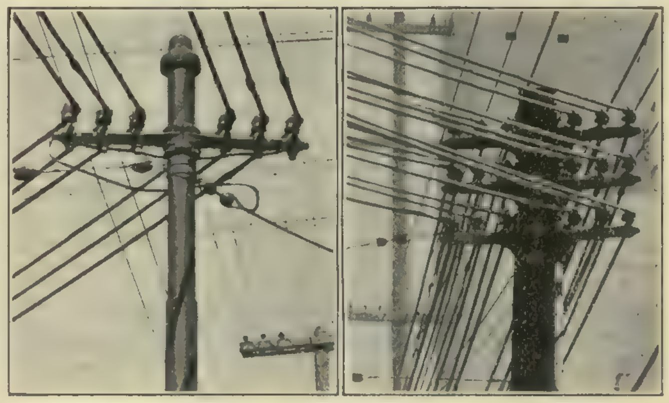
When, however, No. 0000 was adopted as the standard size feeder, this wood pin for corners had to be replaced with something stronger. In San Francisco in 1890 the substitute was a ¾-in. round wrought-iron pin, with a lead top threaded to correspond to the insulator. The glass insulator then proved to be the weakest feature of the combination and it was replaced with the composition corner-pin insulator.

The advent of the 500,000-circ. mil cable and larger for overhead feeders showed up the defects in the ¾-in. pin and composition corner insulator. The insulator crushed under the pressure at turns or softened when the feeder was overloaded and became hot, and the ¾-in. pin bent under the corner strain.

At this point there were two very different methods adopted in different parts of the country. In San Francisco the old plan of turning the conductor on a single pin was adhered to, and the dimensions and strength of this pin were increased again. Elsewhere various forms of "feeder wire strain clamps" or "cable clamps" were brought out, whereby the strain of the feeder cable was removed almost entirely from the corner pin and transferred to the crossarm, and often ultimately to an anchor guy.

Before going further it should be stated that the San Francisco heavy feeder line standard includes self-sustaining iron poles at corners and cast-iron cross arms with cold-rolled steel pins cast into the arms. The self-sustaining pole permits the elimination of guys in connection with taking feeders around corners. When the use of the 500,000-circ. mil feeder had shown the ¾-in. iron pin and composition insulator to be inadequate for corners, the size of the pin was increased to 1½ in. and it was made of cold-rolled steel, and identical in size, shape and threading with the standard wooden pin with 1⅛-in. diameter top. This pin proved equal to supporting the corner strain resulting from taking any size feeder up to 1,000,000-circ. mil cable around it without feeder strain clamps and guys, but the insulator was yet to be developed that would have the insulating qualities needed, and stand the crushing strain of such a heavy feeder at turns and the heat of an occasionally overloaded cable. This was accomplished by making the insulator of the well-known close-grained lignum vitæ wood.

Since the new standard of 1½-in. steel pins (1895) and lignum vitæ insulators (1904) were adopted not a pin has been broken nor has an insulator failed from crushing or burning on corners. Out of many thousands of the latter a very small number have failed on the straight line from checking or from internal defects in the wood, but after ten years of use nothing appeals to us in San Francisco as better for the purpose. Possibly where there is lightning these lignum vitæ insulators might not endure so long, or where there are ice loads on the feeders, extreme contraction strains or tornadoes the 1½-in. steel pins might not stand the strain so well. All that would be necessary in the last-named case, however, would be to increase the size of the corner pin to 2 in. and thereby increase the safe load by 137 per cent, as the strength of round pins varies as the cubes of the diameter. This increase in size of the pin to 2 in. would, however, necessitate redesigning the lignum vitæ insulator to accommodate the enlarged pin.



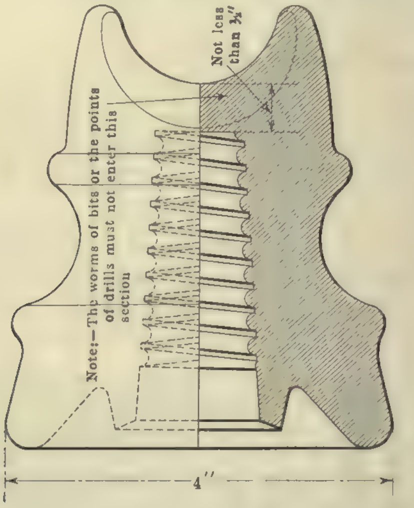
REINFORCED TUBULAR STRAIN POLE, AND BOX-GIRDER FEEDER-TURN POLE IN SAN FRANCISCO

Following the old standard wood-pin design, the steel pins were constructed so that the center of the feeder on a corner applied the pressure against the pin at a point 4 in. above the crossarm. Under those conditions, allowing 60,000 lb. as the ultimate strength of steel, a 1½-in. pin would stand a pressure of 2500 lb. with a factor of safety of two, as is conceded in the National Bureau of Standards' new safety rules to be sufficient for pins.

Under these conditions the bottom petticoat of the insulator is 2 in. above the iron cross arm. As 500 volts will not jump 1 in., and as the poles are not absolute grounds, it seemed to be quite safe to make this distance between insulator and arm 1 in., as in an actual case the bottom of the insulator had been only ⅝ in. above the iron arm at a corner pin for eleven years without producing failure.

With the pin thus shortened the load at the side score of the corner insulator was brought to within 3 in. of the iron cross arm and the safe load on the pin was made 3300 lb. with a factor of safety of two.

That this strength is ample is shown by the fact that the pressure against the side of the corner insulator at a 90-deg. turn, provided with two symmetrically arranged poles, each at the apex of an angle of 135 deg. included by the feeder, is as follows for the different size feeders assumed to have the sag in a 100-ft. span set opposite them:


Not less than ¾″
Note:—The worms of bits or the points of drills must not enter this section
4″

LIGNUM VITAE CABLE INSULATOR

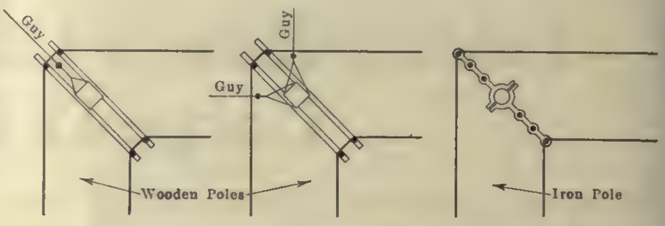
No. 0000 B. & S. double-braid weatherproof, 1 ft. sag....	710 lb.
500,000 circ.-mil double-braid weatherproof, 2 ft. sag....	950 lb.
1,000,000 circ.-mil double-braid weatherproof, 3 ft. sag....	1,125 lb.

The crushing strength of lignum vitæ is 13,000 lb. per square inch. In passing around one of these San Francisco designed insulators at an angle of 135 deg., included between the directions of the diverging parts of the feeder, a 1,000,000-circ. mil double-braid feeder covers 1⅜ sq. in., thus giving a factor of safety of twelve on the outside of the insulator. There are more than 7 sq. in. of area of contact inside the insulator between the wood and half the threaded 1½-in. steel pin, thus providing a factor of safety five times as large on the inside of the insulator as on the outside against a factor of two as exacted by the new safety rules for insulators.

The dense texture of this lignum vitæ insures its freedom from absorbing moisture, and its insulating qualities under 500 or 600-volt d.c. work have proved almost entirely satisfactory.

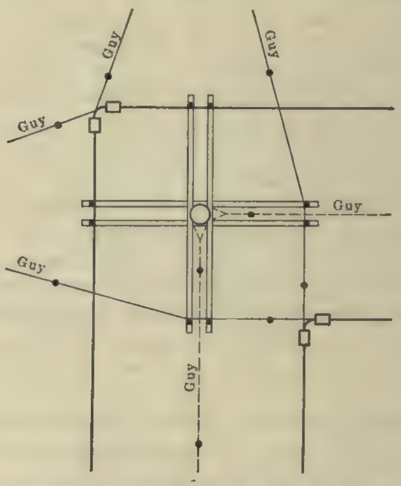
This hardwood insulator was originally designed for the points where it was needed most urgently, namely, on the corners. It was given a round top. When it was found to be cheaper than the other types of straight-line feeder-pole insulators on the market and free from the gradual leaning over or yielding of the composition ones, it was provided with a score on the top and now serves equally well for both feeder-cable uses, straight line and corners.

These lignum vitæ insulators had a severe fire test in the 1906 San Francisco conflagration where great copper cables were melted off and standard-pipe iron tubular poles were heated till they bent over the roadway. The wood insulators, though scorched and in a few cases charred, were ready for service after the ordeal, while the composition ones in all cases had swelled up under the heat and had become worthless for further use. As lignum vitæ wood was very scarce after this fire, in order to get the cars into operation as quickly as possible, insulators of the same shape were quickly turned at the mill from hickory and some from ash for straight line use to be replaced later by lignum vitæ ones.



FEEDER TURN WITHOUT CABLE CLAMPS

The drawings reproduced show the construction and dimensions of this hardwood insulator that has "made good" in San Francisco for the past eleven years. That we have confidence in it and that it justifies this confidence is shown by the statement that at one substation there are forty-eight heavy positive d.c. 500-volt feeders emerging in three different directions without a guy in sight, and at another substation forty feeders go out in several directions without guys to hold them, and no feeder less than 500,000 circ. mil in size. Where a heavy feeder is to be dead-ended at a station, the dead end is made right around the insulator. When it is to be held rigidly around an insulator at a turn, it is provided with a metal tie or "cinch clamp." The self-sustaining pole, the 1½-in. steel pin and the lignum vitæ insulator carry the load and no head guys or drop guys are required.



FEEDER TURN WITH CABLE CLAMPS

An examination of the cross-section of the insulator will show that there is a 4¼-in. creepage distance from the center of the side score to the grounded iron pin inside the insulators, 1½ in. of which is always under cover and dry. In all our experience with these insulators there have been no cases of electrolytic injury to the feeder at the insulator, though there have been cases where in our foggy climate feeders have been corroded badly out in the span at a small break in the weatherproof insulation.

When a cable clamp is attached to a feeder the clamp at once destroys the value of the weatherproof insulation, as in gripping the cable it must get through to the copper and thus demands a strain insulator between it and the crossarm. This clamp is now a bare live spot on the feeder and an element of danger. In foggy San Francisco such a combination invariably leads to leakage over the surface of the strain insulator to the grounded iron arm. The strand quickly corrodes at the cable clamp side of the strain insulator and the guy breaks unless replaced in time.

To get the best results it is absolutely necessary that these insulators should be made only of clear wood; for straight-line work the thickness of wood between the top of the pin hole and the bottom of the top score should be fully a half inch; that the pin hole should be bored with a bottoming drill and not with a bit having a worm at its end; that the insulator be given two good coats of linseed oil paint before being put out, and that the insulator be painted occasionally when in service. Some of them were exposed for about ten years without repainting in San Francisco without failure, but such treatment is inadvisable.

The use of the lignum vitæ insulator on corners in self-sustaining iron-pole work saves the cost of two cable clamps per feeder, two strain insulators, four pieces of guy cable, and the labor of installing them all and fitting and soldering jumpers; furnishes a cheaper, more durable and better looking job, permits more feeders to be accommodated on a given pole-head space and eliminates the danger of galvanized-iron guys corroding off at the positive side of the strain insulators from creepage of current.

In a case of a wood pole and two feeders as shown in the illustrations, its use at turns means one-half as many crossarms, one-half as many insulators, one-sixth or one-third as many guys, no cable clamps at all or strain insulators connected to feeders, no fitting of jumpers or soldering, a far neater looking piece of work and more feeders on the same pole-head space—in other words, less money spent for overhead material, lower labor and maintenance cost and a better looking job.

As a matter of fact, it is difficult to find a location in city work where feeders can be taken around a 90-deg. corner on a one-pole turn. On account of the wide sidewalk, the curved curbstone and the cesspool at the apex of this curve, these corners are usually contrived by a two-pole turn. The argument for the single pins, single insulators, crossarms bisecting the included angle of turn and self-sustaining poles, as against the cable clamps, double sets of crossarms at right angles to the lines of the conductors and guyed conductors and poles, still applies in the case of the two-pole turn.

Of the two photos of typical feeder-turn poles shown, one is of a box girder station pole with its load of eighteen heavy cables, fourteen 500,000-circ. mil and four 1,000,000-circ. mil, about one-third of a substation's d.c. load. There are twenty-five of this type of pole on the system.

The other photo is of an outlying tubular line pole with six 500,000-circ. mil cables besides serving as a pull-off pole for a double No. 00, 90-deg. curve. This pole is a standard-pipe, three-joint, 6-in., 7-in., 8-in. x 30-ft. pole, but is reinforced by a specially built steel beam inside as was described and illustrated on page 109 in the issue of the ELECTRIC RAILWAY JOURNAL for July 15, 1916. There are several hundred of this type on the system. Both poles are self-supporting and on both the lignum vitæ insulators are used, some of the round-top and some of the scored-top type. Both of these poles have been in service about twenty years and are as good as when set, as they have been protected from internal corrosion by being filled with concrete and from external deterioration by regular painting.

AMERICAN ASSOCIATION NEWS

Flag Raising at Hampton, Va.

Under the auspices of company section No. 10 and of its flag-raising-day committee, impressive flag-raising exercises were carried out at the carhouses in Hampton a few days ago. Music by the Soldiers' Home Band, and addresses by Hon. Harry Houston, speaker of the House of Delegates, Gen. Joseph F. Smith, governor National Soldiers' Home, and Col. W. S. Copeland, editor *Daily Press and Times Herald*, were the features of the exercises.

In opening the exercises, E. C. Kelly, president of the section, read a brief report of the action of the National Railway Association in pledging its support to the Government. In his address, Mr. Houston paid a high tribute to President J. N. Shannahan of the company for the patriotism displayed in every undertaking of the community, stating that as much as a year ago the company had responded to the call for preparedness in furnishing armory facilities for the local battery. The other speakers also expressed appreciation of the work of the company.

At the meeting of the section held on June 1 the flag-raising-day committee reported that the exercises had proved very popular in the community, and that Newport News was arranging similar exercises. At the preceding meeting of the section, held on May 10, home gardening was the topic of discussion. A representative of the Hampton Normal and Agricultural Institute gave a talk on this subject and distributed leaflets containing garden hints to the members. At this meeting, also, Mr. Staenglen spoke on rail bonding.

Bulletin on Coal Situation

The committee on national defense is sending out today the following bulletin to electric railway companies:

> L. S. Storrs, president of the association and vice-chairman of its committee on national defense, acting for the association and the committee, has taken up with the coal production committee of the Council of National Defense the question of assuring to the traction utilities of the country a continued supply of fuel, and the committee makes this statement of the result of the conference with the approval of the National Council and at the request of F. S. Peabody, chairman of the coal production committee.
>
> Mr. Storrs pointed out to Mr. Peabody that should a condition occur whereby the traction companies were, through lack of fuel, compelled to cease or interrupt their service, a great hardship would ensue for the communities served. The necessity of transportation service to the public was emphasized and the request was made that some plan for the preferential treatment of fuel consigned to public utilities be arranged on the same basis as that upon which fuel for steam railroads is to be handled during emergencies or when embargoes are in effect.
>
> Mr. Peabody assured Mr. Storrs that such a plan for the preferential treatment of the public utility coal supply will be made effective, should emergency require it. It is, of course, essential in addition that each individual company insure as far as possible its own fuel supply by having on hand an ample reserve supply, particularly during the winter months. While it may at a later date be necessary to urge upon electric railways conservation of fuel by the elimination of such service as can be abandoned without serious det-

riment to the needs of the public, your committee feels that it can assure the companies that their needs will be taken care of and that there need be no fear of such a shortage as will necessitate the shutting down of public utility power plants.

Your committee intends to co-operate to the fullest extent with the coal production committee in conserving the fuel resources of the country and at the same time to co-operate with the individual companies, so that the traction lines can render the best possible service to their communities.

Section No. 11 Issues Handbook

The joint company section of the Toledo Railways & Light Company has just issued a booklet which should prove suggestive to other company sections. It is of convenient pocket size, 4 in. x 6 in., and comprises thirty-nine pages of text.

A preface signed by T. J. Nolan, chairman of the executive council, gives certain general suggestions to employees and outlines briefly the development of the section organized on Jan. 23, 1917. Following this is a copy of the constitution and list of officers and committeemen. Next the functions of the executive council and officers are explained and the requirements for membership in the several associations making up the joint section are listed, including a table of membership dues. A full list of members with home addresses, arranged by departments, is also given. Finally there are blank forms for use in applying for membership, correcting entries, and withdrawing from membership, as well as a table of attendance at the educational classes during recent months.

COMMUNICATIONS

Riding Qualities Not Affected by Equalization

L. B. STILLWELL, CONSULTING ENGINEERS
NEW YORK, June 7, 1917.

To the Editors:

Referring to W. H. Heulings's communication published in your issue of May 19, I wish to point out certain erroneous conclusions which he reached from reading my communication printed in your issue of May 5.

I do not lean toward a flexible side frame for any truck, but, on the contrary, stand straight up for the most rigid form of side frame. In my opinion, the necessary flexibility to secure proper equalization of weight on all four wheels of a truck should be provided for by the springs interposed between the journal boxes and the side frame, and by flexibility which is produced by the design of the transoms connecting the two side frames.

In his communication Mr. Heulings says: "The movement of the equalizer bar is restrained by springs which distribute the load." But the type of equalizer bar described by Mr. Bullock, and which is under discussion, rests directly on the journal box, and its vertical motion can in no possible way be restrained by springs or other means. In my opinion the name "arch-bar truck" is not applicable to the type referred to by me as having springs directly over the journal boxes. The name "arch-bar truck" is usually associated with the type having no journal box springs, and used principally under freight cars.

Mr. Heulings's suggestion that the skeptic should test the riding qualities of certain trucks of different design operating over the same roadbed was followed up by Mr. Potter's invitation to the skeptic to continue his investigation to the New York, Westchester & Boston Railway and neighboring roads, where trucks with equalizer bars and trucks with springs directly above the journal boxes can be compared in similar service. If the skeptic wishes to continue his comparison on a steam-operated road, the Erie Railroad offers an excellent opportunity to compare the riding qualities of the "time-tested" equalizer-bar trucks and the riding qualities of trucks fitted with springs over the journal boxes. The popular verdict is that the latter design, which is used under the Erie Railroad's all-steel cars, rides better than the older type of truck under that company's steel underframe or wooden cars.

However, in making his suggestion, Mr. Heulings is really wandering from the subject of equalization to that of comparative riding qualities, which is a totally different matter, as the skeptic can easily prove to his own satisfaction by close examination of the trucks referred to by Mr. Heulings. Among these the trucks with hard riding qualities can still claim complete equalization. F. M. BRINCKERHOFF.

Engineers in the C. E. R. A.

TERRE HAUTE, INDIANAPOLIS & EASTERN
TRACTION COMPANY
INDIANAPOLIS, IND., May 31, 1917.

To the Editors:

Some time ago you published an editorial suggesting a subdivision of the Central Electric Railway Association. I take it that in general the reason for a subdivision is to stimulate increased attendance of the engineers at the association meetings. However, if it amounted to anything at all, which no doubt it would, it would then soon develop into practically a separate association which would meet separately from the general association. As a result, other officials of the association, who would be interested in the engineering matters now occasionally discussed, would then not secure the benefit of such discussion.

It appears to me that a better plan would be the appointment by the association of a committee of engineers to keep in touch with other committees of the association, particularly the program committee for the purpose of arranging to have any subjects of interest to engineers incorporated in the program.

This committee could also recommend the appointment of other committees when necessary to which could be referred the standards of the American Electric Railway Engineering Association, and they could then either suggest adoption or changes as the case might be. The A. E. R. E. A. is doing excellent work, but many of the standards which it has proposed have not been generally adopted by member companies of the C. E. R. A. If such rules were referred to a committee which would be in touch with the American Association the reason for this condition could be investigated and a more general adoption of the rules would probably result. A. SCHLESINGER,
Superintendent Distribution and Substations.

Publicity Agents Meet

An informal gathering of a number of publicity agents employed by electric railway companies took place this week at St. Louis at the time of the meeting of the Associated Ad Clubs of the World in that city. A pleasant time was enjoyed by all, but those present decided to postpone action upon establishing a formal organization until the next meeting of the American Electric Railway Association.

Practical and Economical Solutions of Problems in EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

One-Man Cars for Tacoma

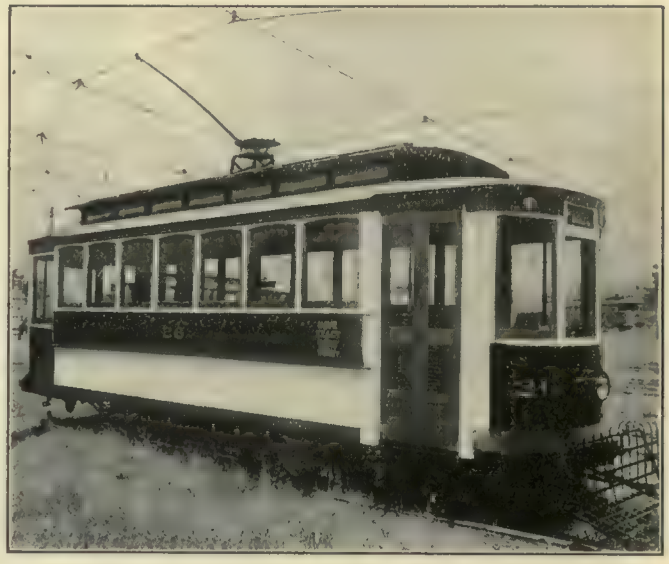
Rebuilt Cars of the Single-Truck Type Have Become Popular with Employees and Public

BY K. C. SCHLUSS
Superintendent of Power and Equipment Tacoma Railway & Power Company, Tacoma, Wash.

The Tacoma Railway & Power Company has recently rebuilt six of its old-style, single-truck, closed cars to make them suitable for one-man operation, the cost of reconstruction, inclusive of air brakes and prepayment facilities for double-end service, approximating $1,300 per car. By operating this equipment at one-half the former headway a very great increase in traffic—approaching 100 per cent—has been effected, and the public is very well satisfied.

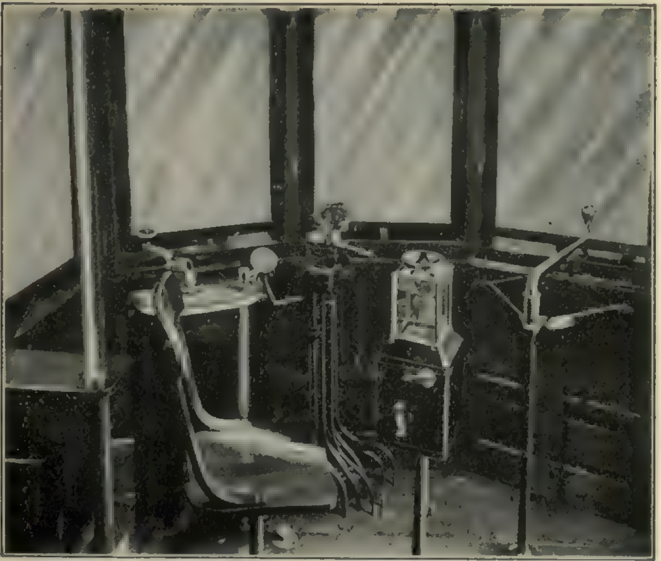
Originally the cars were of the convex-concave-side type, with monitor roofs and drop platforms. They were equipped with Brill 21-E trucks and GE-58 motors and were operated with hand brakes. The rebuilding included a minimum amount of alteration to the bodies and platforms, together with the addition of Westinghouse semi-automatic air brakes, pneumatically controlled doors and steps, air sanders which are operated automatically in emergency, dead man's circuit-breaker control and other safety features. This type of equipment has been described in detail in the ELECTRIC RAILWAY JOURNAL of Sept. 2, 1916, under the title "Equipment of the Safety Car."

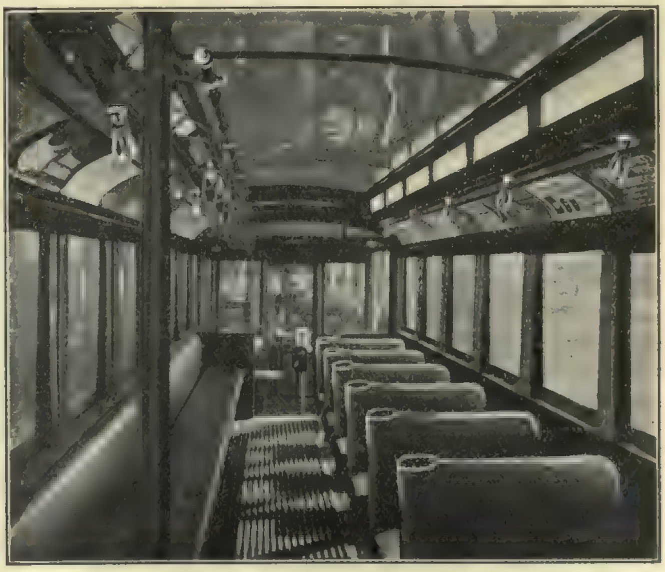
The general dimensions and weights are given in the table in the next column.


EXTERIOR VIEW OF REBUILT CAR

The weight of the air equipment complete, including safety devices, piping, hangers, etc., is estimated to be 1350 lb. This is slightly higher than usual for this type of car, due to the use of a larger compressor than is generally required to operate the brakes and other apparatus. The company had on hand a number of Christensen AA-1 compressors and they were utilized on these cars. In order to conserve space a sheet-

Length over all	31 ft. 0 in.
Length of body	20 ft. 0 in.
Width at sills	7 ft. 1 in.
Width over all	7 ft. 10 in.
Height—rail to step	16 in.
Height—step to platform	12½ in.
Height—platform to floor line	10 in.
Height—rail to floor line	38½ in.
Truck wheelbase	7 ft. 6 in.
Seating capacity	29
Light weight of car complete	24,200 lb.


FRONT PLATFORM WITH FARE BOX, CONTROL AND BRAKE EQUIPMENT AND REVOLVING CHAIR FOR OPERATOR


INTERIOR VIEW OF ONE-MAN CAR, SHOWING LONGITUDINAL AND TRANSVERSE SEATS

metal housing was designed to replace the wooden box originally furnished with the compressors.

The principal changes made to the body proper include the removal of the bulkheads and the rearrangement of seats. The bulkheads are cut off at the height of the inside window sills, the lower portions being cased over and a 1-in. pipe stanchion extended from each section to the end plate which is arched to conform to the contour of the roof. The opening between the stanchions is 36 in. The preference of the public for cross-seats influenced the adoption of this type of seating plan so far as possible, but since the width between posts at the floor line is only 6 ft. 4 in. it was necessary to retain the longitudinal seat along one side of the car. All seats are upholstered with Pantasote.

The platforms originally had stationary steps and manually operated doors on both sides. These were removed, the left side of each platform being closed and a stationary window installed which corresponds in height and design to the vestibule windows. On the right side is installed a two-leaf folding door which swings out and against the body corner post. The clear opening of the door is 32 in. The folding step is supported by hinged brackets and operated automatically with the door. The doors and steps are operated entirely by air, excepting that with an emergency application of the brakes the door on the rear platform may be opened by hand, after releasing an ordinary door flush bolt which is located near the center of the door in plain view of anyone attempting to leave the car. The steps are lighted by a lamp above each door which is switched on and off automatically as the door opens or closes. This is accomplished by means of a contact connected to the door operating rod.

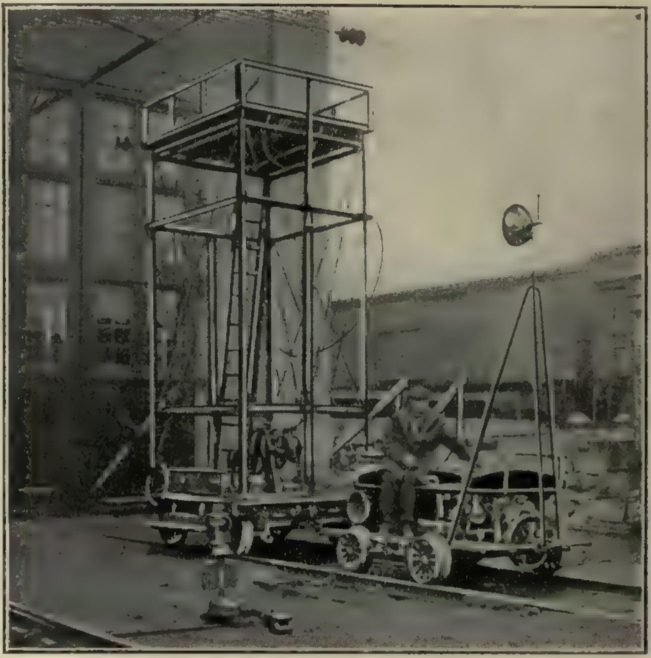
Miscellaneous equipment not previously mentioned consists of motorman's revolving stool, push buttons and buzzers for signaling motorman, Johnson fare boxes, International registers, "Golden Glow" headlights, rotary gongs and Earll trolley retrievers. Although the company's standard color for city cars is dark green, these cars are being painted maroon and cream to give them a distinctive appearance. One of the accompanying illustrations shows the arrangement of controller, brake valve, hand brakes, fare box and motorman's chair on the front platform, from which it will be seen that elaborate provisions for the operator's convenience have been provided. This has eventually resulted in making the one-man runs popular among the platform men, and in many cases they are claimed as preferred runs by senior men.

Line Car Saves Railroad $2,000 a Year

Gasoline-Propelled Maintenance Car Used on Hoosac Tunnel Electrified Zone of Boston & Maine

Before the Boston & Maine Railroad put in operation the lightweight gasoline-driven overhead maintenance equipment which is shown in the illustration, the line department used a tower mounted on an ordinary flat car. This required a steam engine, caboose, and a crew of eleven men to complete the equipment, while a foreman, two linemen and two groundmen are all that are required for the new outfit. The latter also gets to the scene of the trouble quicker, with the result that traffic delays due to line failures have been greatly reduced.

The motor car is driven by a four-cylinder Fairbanks gasoline engine, and is provided with an acetylene headlight mounted on a pipe standard on the front of the car. The reflector can be set at any angle, and is particularly useful in inspecting the wiring in the tunnel.


BOSTON & MAINE'S MOTOR-DRIVEN LINE CAR

The motor car will make a speed of 60 m.p.h. alone, and 20 m.p.h. when drawing the tower car.

The latter has a lightweight wrought angle-iron framework braced with 3/8-in. steel cable. It is 7 ft. square, and can be used at heights between 12 ft. and 18 ft. It is equipped with the usual maintenance equipment. To prevent tipping when the tower is in use the car is clamped firmly to the rails. The car has been in service for two years, and by economy in fuel and labor has saved $4,000 for the company.

Track Repairs Speeded Up by Use of Oxy-Acetylene Tools

The Puget Sound Traction, Light & Power Company has been speeding up its track repair work by means of gas-welding. The accompanying illustrations show the different steps in a recently completed job in which a Prest-O-lite welding and cutting outfit was used to cut out a broken section of rail and then build up the rail to give an even running surface. This job was done in about half the time which was formerly required to replace rails which had been broken.

TRACK REPAIR GANG WORKING AT NIGHT

THREE STEPS IN REPAIR OF RAIL—1, BROKEN SECTION BEFORE REPAIR—2, RAIL WITH BROKEN SECTION BURNED OUT—3, REPAIRED RAIL AFTER SEVERAL WEEKS OF SERVICE

The first of the three grouped pictures shows the broken section of rail on the near side of the switch mate, the switch mate itself not being broken. The second picture was taken after the broken section had been burned out, and the third picture of the group shows the section after it had been repaired and subjected to several weeks' wear.

This work was all done between midnight and 3 a. m. on account of the heavy traffic which passes the point in the daytime. One of the accompanying illustrations shows the gang at work on the job.

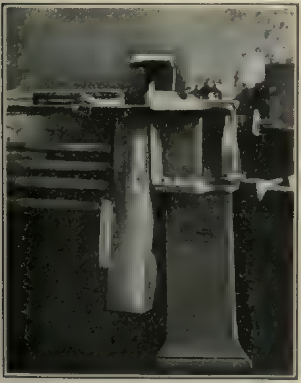
Carbon Brushes Recut with Carborundum Wheel

Motor Brushes Made Into Compressor Brushes at Rate of 500 Per Day

BY E. R. PIKE

Assistant Superintendent Fifty-second Street Repair Shop
Brooklyn (N. Y.) Rapid Transit System

Worn motor brushes are cut into smaller sizes and are used for compressors in the Fifty-second Street shop of the Brooklyn Rapid Transit Company. This is done by means of a carborundum wheel 12 in. in diameter and 3/32 in. thick, which is mounted as shown in the illustration and driven by a belt at a speed of 1860 r.p.m. A circular hood connected with a suction blower is mounted over the wheel to remove the fine dust, while heavier carbon particles drop through an opening in the table into a receptacle from which they are removed from the bottom. The guides on the table are adjustable so that any sized brush can be cut.



MACHINE FOR CUTTING CARBON BRUSHES

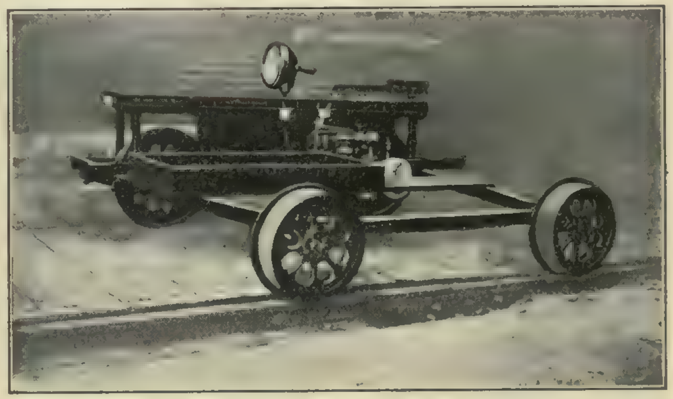
The motor brushes are of different lengths and widths but are all ½ in. in thickness. These are sawed into brushes ⅜ in. thick. Three or four cuts are necessary for each brush, one to shave it down to the proper thickness, and other longitudinal and transverse cuts, depending upon how badly the brush is worn. Recutting brushes without reducing the thickness was tried out but was found to be unsatisfactory, as many of the brushes were worn to such an extent on the flat side that recut brushes of a uniform size could not be obtained without reducing the thickness to ⅜ in.

As the recut brushes are used for the car air compressors no new brushes for these machines have been necessary in several years so that considerable economy has been effected. About 500 brushes can be cut in a nine-hour day.

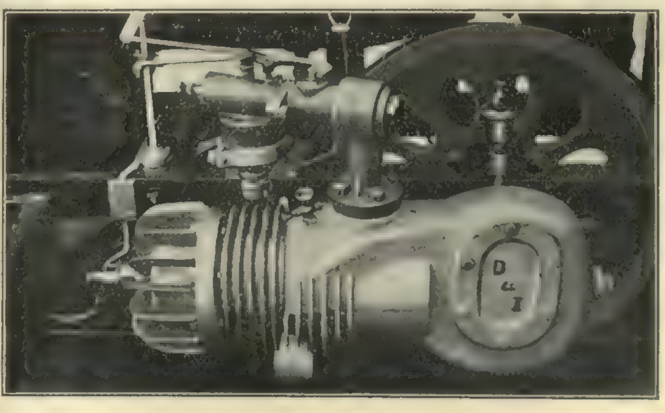
Gasoline-Propelled Inspection Car Gives Good Service

The Denver & Interurban Railway, Denver, Col., has constructed in its shops the gasoline-propelled inspection car shown in the accompanying illustration. The car has been driven 35,000 miles, and the only repairs necessary have been three sets of tires and two sets of engine bearings. It has given such excellent service that three more cars of the same design have been constructed. The cost of the car was $125.

It is of rugged construction and will carry three men and their tools up a 4 or 5-per cent grade without difficulty. The car is equipped with an incandescent headlight, the current for which is supplied by storage batteries. When not working at night the batteries are easily removed. The total weight of the car is 350 lb., and the single cylinder two-cycle engine which drives it weighs 75 lb. This engine was designed and built in the company's shops and is shown in one of the pictures, which also illustrates the method of attaching the engine to the truck frame.



GASOLINE-PROPELLED INSPECTION CAR, DENVER, COL.



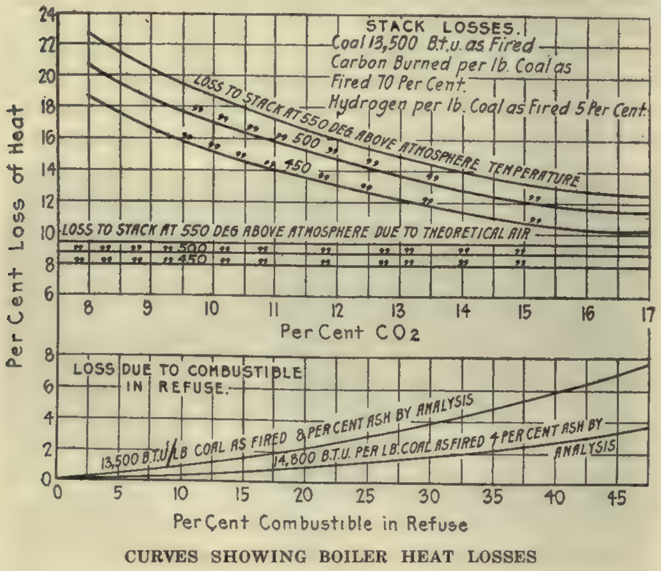
ENGINE OF INSPECTION CAR SHOWING METHOD OF MOUNTING ON FRAME OF TRUCK

Heat Losses in Steam Plants*

Boiler Economy Effected by Control of Excess Air and Combustible in Refuse

BY H. F. LAWRENCE
Test Engineer American Engineering Company, Philadelphia, Pa.

In steam generating plant operation the heat losses due to excess air are the most important of any of the heat losses that can be controlled to any extent. The upper set of curves in the accompanying illustration shows the percentage of heat or percentage of coal which is lost through the stack for different temperatures of excess gases and percentages of CO_2. The straight lines labeled "Loss to stack at 450 deg., 500 deg. and 600 deg. above atmosphere due to theoretical air" show the percentage of coal required for heating the furnace gases from atmospheric temperature up to the stack temperature. With no excess air, and perfect combustion these lines represent the heat lost through the stack for various temperatures. With different amounts of excess air indicated by various percentages of CO_2 the total heat loss through the stack is as shown by the upper curves. The differences between the lower curves and the upper curves is the excess air loss.



CURVES SHOWING BOILER HEAT LOSSES

It should be remembered in the interpretation of these curves that 16 per cent CO_2 represents 12.4 per cent excess air, 14 per cent CO_2 represents 39 per cent excess air, 10 per cent CO_2 represents 87 per cent excess air, and 8 per cent CO_2 represents 123 per cent excess air. When the CO_2 is reduced from 16 per cent to 10 per cent, the heat loss is increased by approximately 6 per cent of the coal burned, provided, of course, that the exit temperature remains the same. The volume of gases is much greater with 10 per cent CO_2 than with 16 per cent, owing to the greater amount of excess air, and the temperature of combustion is lower; therefore the heat absorbed by the boiler is less, so that the final temperature is higher and the heat loss due to excess air is greater than is really shown by the curves. A difference of 100 deg. in the exit temperature represents a loss of about 2½ per cent.

The lower set of curves shows the losses due to the combustible in the refuse. This loss in coal containing 4 per cent ash is approximately only one-half the loss due to combustible in the refuse of the coal burning 8 per cent ash. The curves show it is more important to burn out the carbon in a high-ash coal than a low-ash coal. While this is simple, there is a point beyond which it is not advisable to burn the combustible in the refuse, as large volumes of air are required to burn out the coke to a minimum, and the loss due to excess air greatly exceeds that which would have occurred had the combustible been dumped with the ash. The best plan of operation is to find this point by test or gas analysis and then operate accordingly.

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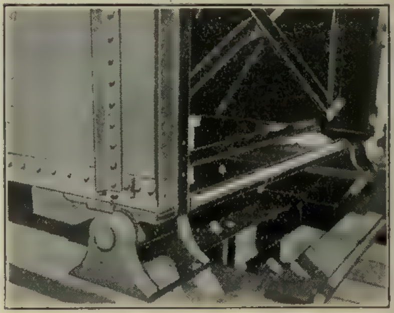
*Abstract of a paper delivered at a recent meeting of station and operating committee of the Ohio Electric Light Association.

Railroad Constructs Temporary Drawbridge at Seattle, Wash.

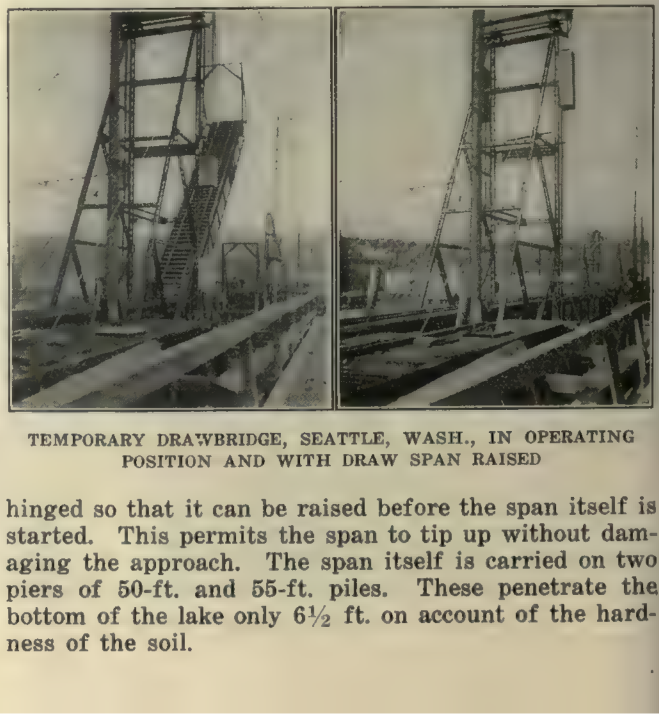
The accompanying illustrations show a jack-knife draw span bridge constructed by the Puget Sound Traction, Light & Power Company over Lake Union, Seattle, Wash. The bridge was necessitated by the delay in the construction of the new bascule span which is now in the course of erection. The railway has operated cars over a double-track trestle at this point for many years, but with the opening of the government canal leading to Lake Washington it became necessary to provide a waterway for vessels.

The temporary drawbridge is made of second-hand material and was built under the direction of the Stone & Webster Engineering Corporation. The span is composed of 90-ft. deck plate girders, 6 ft. in depth. The tower is 72-ft. high and over it pass two cables attached to the girders at approximately one-third the span. These cables run to the electric hoist housed in a building about 30 ft. back from the tower. The weight of the draw span is 30 tons and this is counterbalanced by four concrete weights, totalling 4000 lb. The weights are suspended in pairs, one above the other and work in relays. On starting to raise the span both weights are available and when the span has reached an angle of 22½ deg. with the horizontal the counterweight is diminished.



HINGE OF TEMPORARY DRAWBRIDGE

At the approach adjacent to the hinged end of the draw span there is a 7-ft. section of track which is also hinged so that it can be raised before the span itself is started. This permits the span to tip up without damaging the approach. The span itself is carried on two piers of 50-ft. and 55-ft. piles. These penetrate the bottom of the lake only 6½ ft. on account of the hardness of the soil.

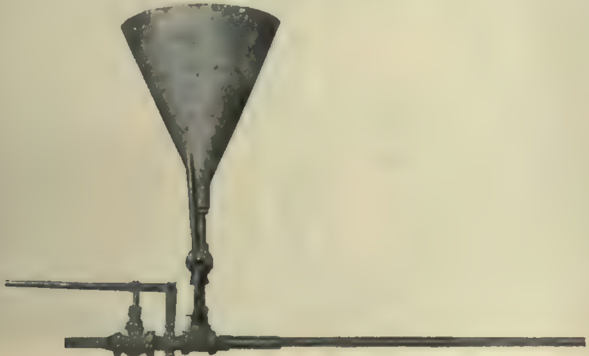


TEMPORARY DRAWBRIDGE, SEATTLE, WASH., IN OPERATING POSITION AND WITH DRAW SPAN RAISED

Condenser Pipes Cleaned by Sand Blast

BY J. C. FALKNER
Chief Operating Engineer Richmond Light & Railroad Company, New Brighton, N. Y.

Cleaning condenser tubes is accomplished in this company's power house by means of the air-operated sand-blasting outfit shown in the illustration. The long pipe on the right is pushed into the condenser, and is slightly tapered so as to fit the condenser tube easily. The short section of pipe on the left is connected to the air supply and is provided with a lift gate valve. The sand is held in the large funnel, the flow being controlled by a gate valve. The top of the funnel is covered with cloth to prevent the sand being blown out and into the faces of the operators, in case both valves should be opened at once. Two men operate the device, one guiding it and the other operating the valves.

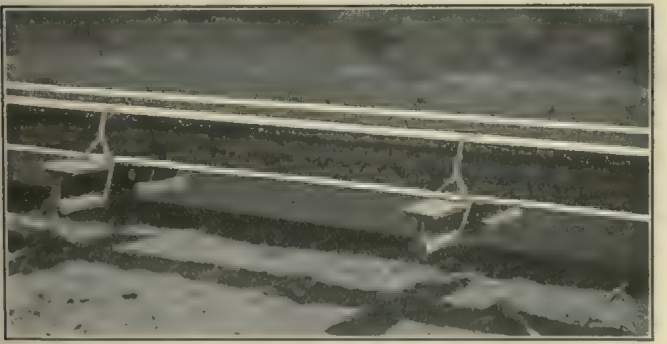

SIMPLE SAND-BLASTING OUTFIT USED FOR CLEANING CONDENSER TUBES

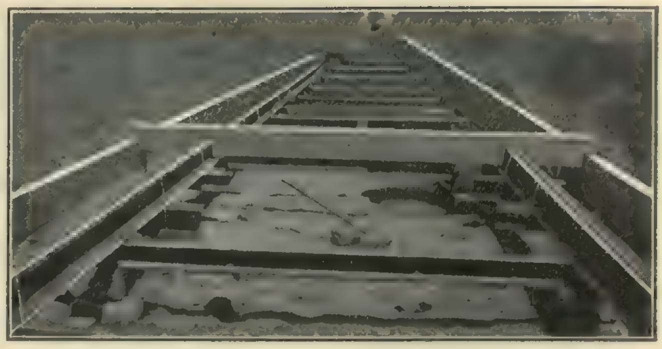
As reported in the issue of the ELECTRIC RAILWAY JOURNAL for May 19, 1917, page 914, the National Electric Light Association gave sand blasting as an effective method of cleaning condenser pipes. However, as this report mentioned only the use of a high-pressure water jet for driving the sand, I thought that a description of the air sand-blasting method used by us would be of interest.

Worn-out Rail Used as Steel Ties in Concrete Foundation

The Southern Traction Company at Sherman, Tex., is using a lot of its worn-out 30-lb. and 40-lb. rail as steel ties and rail bases in its new track construction, which is laid in a concrete foundation.

Long sections of the old rail are spaced every 9 ft. and serve as ties. They are placed with the bases up, as shown in one of the accompanying illustrations, and are fastened to the track rail by bolts passing through the base of the old rail and clamping onto the base of the new track rail. Spaced equally between the long ties are two 18-in. lengths of rail. These are also placed with the bases up, and are wired to the base of the track rail. After the concrete is poured the wires are cut. Two short sections opposite each other make virtually as good a foundation as a complete tie.


USING UP OLD RAIL AS STEEL TIES, SHERMAN, TEX.


SHORT TIES MADE OF 18-IN. LENGTHS OF OLD RAIL AND SPACED EVERY 3 FT. BETWEEN LONG TIES

By this type of construction the company has avoided the cost of wooden ties and has used up a lot of worn-out rail for which there was no other use. The illustrations show the work being done on a section 2200 ft. long, and this type of construction is being contemplated for future track work.

Special Tie Plate Holds Rail to Gage and Alignment in Addition to Supporting It

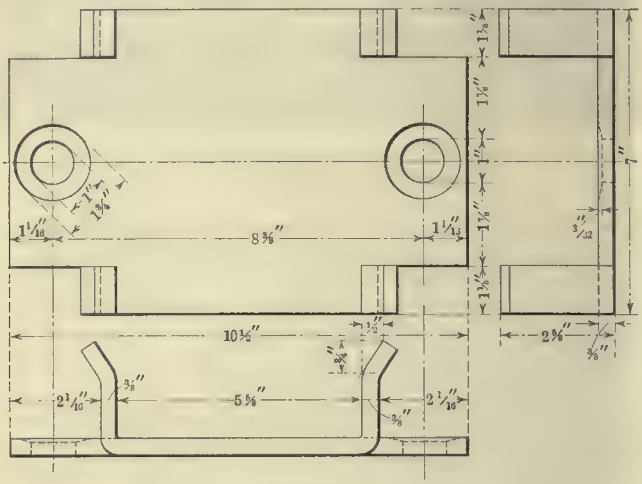
The Vaughn rail support, pictured herewith, is a device manufactured by the St. Louis Frog & Switch Company for serving at once as a tie plate and as a means of holding the rail to gage and alignment. It is made of open-hearth steel of special quality with a usual width of 7 in., thickness of ⅜ in., and length dependent on the size of rail base with which it is used.

The support is usually applied to wooden ties by means of two screw spikes, the ties having previously been bored to proper gage by mechanical means in the materials yard. In the field, therefore, it is necessary simply to screw in the spike. Another way of using the tie plates is to bore the ties and fasten the plates to them in the materials yard before sending them to the job. It is then claimed that the rail can be securely applied at less expense than spiking, by the cheapest class of labor, with the assurance to the engineer that his track will be properly gaged and supported. The bending over of the lips or projections on the plate firmly ties the rail base to the plate, so that this support not only holds the rail to gage, but also prevents creeping or rolling of the rail under traffic.

TIE PLATE BEFORE AND AFTER CLAMPING TO RAIL

The Vaughn support has not been extensively used by the steam railroads, because it has been impossible to compete in price with the ordinary tie plate, but 500,000 have been manufactured for various electric railroads, principal among which is the United Railways of St.

Louis, Mo., which has installed several hundred thousand in the last five years. In 1912 this company used the Vaughn plate in laying about 2½ miles of 7-in., 103-lb. Lorain steel section No. 426 rail on oak ties, spaced 2-ft. centers, and about 5 miles of track with 100-lb. A. R. A. T-rail with oak ties, 2-ft. centers. Since the year 1912, the St. Louis company has laid approximately 30 miles of track with 100-lb. T-rail on oak ties and used these tie plates. C. L. Hawkins, engineer maintenance of way, reports that sections of this track have been opened up at a number of locations, but that no instance has been found where a tie plate had become loosened, or where there was any excessive vibration when the cars passed over the track.



DETAILS OF SPECIAL TIE PLATE

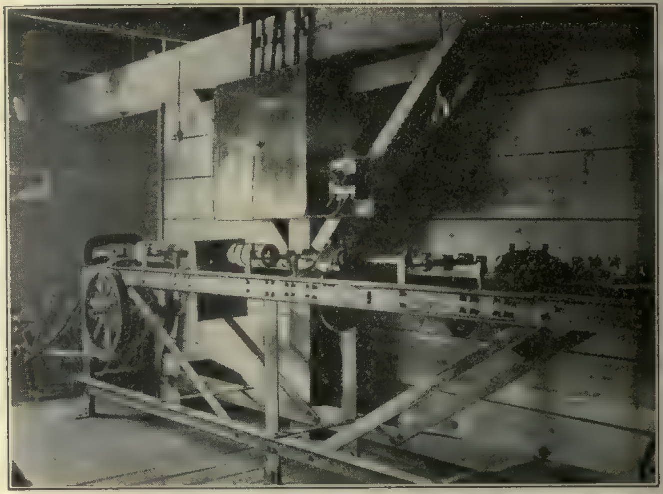
In the St. Louis construction the tie plates are fastened down with standard ⅞-in. x 6-in. screw spikes and the prongs hammered down over the rail base with a sledgehammer and afterwards flattened by a special tool. Little trouble has been experienced with the prongs breaking off when hammered down. A very low carbon steel, ranging from .10 to .20 carbon content is used in the manufacture of the plate and when properly cooled after forging, the steel bends without cracking. The tie plates cannot be taken out of the track and used over again, since the prongs will not stand the extra bending.

SPECIAL TIE PLATES IN ST. LOUIS TRACK

The above illustration shows an installation of these tie plates on a section of track under construction in St. Louis, Mo. In this case they were used with hewn ties.

Reinsulating Wire at Less Than One Cent Per Pound

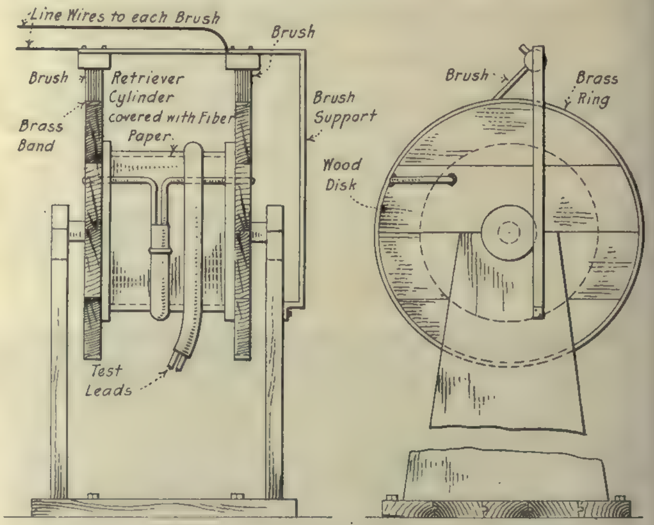
Shown in the accompanying illustration is a machine which is being used by the Washington Water Power Company, Spokane, Wash., for reinsulating wire. Since the purchase of this machine it is no longer necessary for this company to scrap any of its wire or other conductors on account of worn-out insulation. The machine straightens the wire and then winds it with a flat eighteen-strand cotton string. Before the advance in prices the company reinsulated its wire at a cost of less than 1 cent per pound and the original cost of the machine, approximately $500, was saved during the first year of its service.



MACHINE FOR REINSULATING WIRE

Old Trolley Retriever Used to Coil Up Test Leads

In testing motors and other electrical equipment in the shops the current is often taken from the switchboard by leads several feet in length. The Knoxville Railway & Light Company, Knoxville, Tenn., uses an old trolley retriever to keep such leads off the floor. Flexible leads are used and the current is supplied to them through two slip rings attached to the retriever. The leads reach 10 ft. when unwound, and when not in use the retriever promptly coils them on its drum.



OLD TROLLEY RETRIEVER MOUNTED TO COIL UP TEST LEADS

News of Electric Railways

Traffic and Transportation
Financial and Corporate
Personal Mention
Construction News

Chicago Men Reject Increase

President Busby of the Surface Lines, in Answer to Union Demands, Grants Two-Cent Wage Increase but Refuses Eight-Hour Day Basis—Negotiations to Continue

In a letter dated June 2 to William Quinlan, president of Division 241 of the Amalgamated Association of Street & Electric Railway Employees of America, Leonard A. Busby, president of the Chicago Surface Lines, made answer to the demands of the union which were given in detail in the ELECTRIC RAILWAY JOURNAL of May 12, page 887. These demands included two principal questions, the first being the substitution of an eight-hour day for the present ten-hour day, and the second, a wage increase to a maximum of 50 cents an hour, intended to cover the shorter working hours and the increased living costs. In answer to the first, President Busby's letter reads as follows:

MR. BUSBY'S ANSWER

"The average over-all time of our scheduled runs is now barely ten hours, and of this at least one hour is bonus time —that is, time for meals, and time for preparing for and closing the day's work—so that the actual time in operation of cars is nine hours or less, for which ten hours' time is paid. Our present working hours—an average day of ten hours, with a minimum of nine hours and a maximum of eleven hours—were fixed by mutual agreement in 1912 and again in 1915. There is no apparent reason at this time for the reduction of these hours, while on the other hand there is every reason why these hours should be maintained. We are engaged in raising an army of 2,000,000 men. A few days ago in this city at a public meeting the labor representatives of Great Britain stated that for every soldier at the front at least five additional men were required to supply him with arms, ammunition, food and clothing. An army of 2,000,000 men in the field means that upward of 10,000,000 others will be taken away from their actual work and employed in carrying on the war. The reduction of our working hours at a time when the country is mobilizing its full man power for the great conflict is, in our opinion, unwise and wholly unwarranted."

In taking up the matter of wage increase reference was made to the unprecedented wage increase which was granted to the trainmen in 1915. This was far in advance of later wage increases in other industries, brought out during the past year by war conditions. The present wages were shown to be higher than those paid to street railway employees in ten of the principal cities of the nation. The single exception to this is Detroit, where, owing to the concentration of the automobile industries, an unusual labor condition exists. On account of this the Detroit United Railway is unable to get enough men to handle its cars. President Busby said that the maximum wage of 40 cents an hour which has just been fixed in Detroit is by no means as advantageous to the employees from an earning standpoint, taking into account the working conditions and allowances for bonus time, as are the conditions under the present wage scale and contract in Chicago. Mr. Busby also called attention to the high rentals in Detroit and to the materially higher general living costs which prevail in Detroit as compared with Chicago. He said that owing to the combination of interurban rates of fare with city rates, the Detroit United Railway receives an average fare per passenger more than 15 per cent higher than the average fare in Chicago. Mr. Busby said further:

"The remedy in this situation is not in continuing to increase wages to meet inflated prices in food commodities, but in inducing the government to exercise its unquestioned power properly to administer food supplies to prevent speculation and abnormal profit taking. There is now and will continue to be plenty of food in this country for all. There is no warrant for our present food prices. They must and will be reduced. Public opinion is being aroused, and since you presented your contract two weeks ago there has been a marked decrease in prices. We have undoubtedly seen the worst of this situation, and should look forward with confidence to a decline of the present prices to some reasonable basis under governmental direction. Were we to attempt to meet this situation by constant wage increases, which frankly we cannot do, the relief for you would only be temporary, and for this company and all other companies similarly situated the result would be bankruptcy.

"On the other hand, with a fixed rate of fare, the company is obliged to meet a heavy increase in operating expenses due to the increased cost of operating material and supplies. This increase on some articles ranged from 100 per cent to more than 200 per cent during the last eighteen months. The total increase in operating expenses, due to increasing costs of material alone, will be approximately $500,000 and contract prices for next year are still higher.

"Last year, the best in our history, we had an increase of nearly 10 per cent in gross. Our operating material and supplies were purchased in advance at normal prices. We had a favorable year and earned 6½ per cent on our certified capital. This year the increase in our gross is less than half that of last year, and with the increased operating expenses mentioned, our net earnings are materially less than those of last year. These are facts which you can readily verify.

NOTHING TO WARRANT WAGE INCREASE

"There is nothing, therefore, in the present situation, from the standpoint of the company, to warrant a wage increase. We have, however, endeavored to meet a difficult situation in a spirit of utmost fairness, and have decided to offer the men in the train service an increase of 2 cents an hour, applied uniformly to each grade in the present scale. A similar increase is offered to employees in the mechanical departments working about shops and car stations, as shown by the following scales:

WAGE SCALES

Class	Present Rate per Hour	New Rate per Hour
Trainmen—Passenger Service:		
First three months	27 cents	29 cents
Second three months	29 cents	31 cents
Second six months	30 cents	32 cents
Second year	32 cents	34 cents
Third year	33 cents	35 cents
Fourth year	34 cents	36 cents
Fifth year	36 cents	38 cents
Motormen on sprinkler and supply cars	32 cents	34 cents
Trolley boys on sprinkler and supply cars	23 cents	25 cents
Snowplows and sweepers	36 cents	38 cents
Night cars	$3 for 8 hours or less	$3.20 for 8 hours or less
Car repairers, motor repairers, inspectors, dopers and body repairers:		
First year	$2.40 a day	$2.60 a day
Second year	$2.70 a day	$2.90 a day
Third year	$3.00 a day	$3.20 a day
Car placers:		
First year	$2.40 a day	$2.60 a day
Second year	$2.75 a day	$2.95 a day
Car cleaners, switchmen, terminal men, etc.:		
First year	$2.10 a day	$2.30 a day
Second year	$2.40 a day	$2.60 a day
Mechanics in west shops	2 cents an hour increase	

"This wage increase on the basis of the present hours will, when effective, show the following results to our trainmen:

"Regular trainmen, more than 7000 in number, will receive an average wage in excess of $1,150 a year. Extra trainmen, more than 2000 in number, will receive an average wage in excess of $950 a year. All trainmen, including regulars and extras, will receive an average wage in excess of $1,000 a year. These men average ten hours a day paid time and not to exceed twenty-six days a month.

"We submit that this showing is not equaled by the earnings of street railway trainmen in any other large city in the United States. It would naturally be expected that such a wage scale would cause the train service to be regarded as a highly desirable employment, and such is the fact, even under present conditions. The number of applicants for positions in our train service is at present far in excess of our requirements.

"In this connection we desire to call your attention to the fact that the proposed wage increase, together with the increased cost of operating material and supplies, will impose a burden of more than $1,250,000 a year upon the companies."

Mr. Busby's letter further states that any and all questions which either party may desire to submit to arbitration, provided this agreement is not accepted, will be arbitrated by the method provided under the present contract. The new contract submitted for the approval of the men is unchanged except for the wage scale. It will take effect as of June 1, 1917, and will run for a period of three years.

At a meeting on June 5 the union voted to reject Mr. Busby's offer and directed its committee to continue negotiations, but with instructions that nothing less than the original demands would be satisfactory to the union.

Washington Strike Inquiry

A Few of the Important Points Are Touched Upon That Have Been Covered by Recent Witnesses Before the Investigating Committee

William F. Ham, vice-president of the Washington Railway & Electric Company, Washington, D. C., was a witness on May 23 before the committee of the Senate which is inquiring into the recent strike of the employees of the company. Mr. Ham said that in the absence of anti-strike legislation or compulsory arbitration the company considered the individual contract the best preventive of strikes. He again made clear the distinction constantly drawn by the officials of the company between refusal to deal with committees of the Amalgamated Association and willingness to treat with committees of the employees. He reviewed some of the strike history of New York last fall and cited the breaking of contracts there by the Amalgamated Association as indicative of the irresponsibility of that organization.

COLLECTIVE BARGAINING DISCUSSED

Senator Pittmán, chairman of the investigating committee, cross-examined Mr. Ham as to the attitude of the company toward any collective bargaining with the men. Mr. Ham protested against Senator Pittman's interpretation that when the letter of President King of the company was sent to the men on Feb. 27 the company had no idea of dealing with the men collectively. Mr. Ham said that if the men had advanced some proposition eliminating the union it might have been adopted. The only assurance that the company had received from the District Commissioners, who sought to bring the men and the company together, was that the men would accept a contract similar to that entered into with the Capital Traction Company. Mr. Ham also went at length into the workings of the relief association of the company.

At a subsequent hearing the committee inquired into the history of the drafting of the individual contract offered by the company. Among those who testified were S. R. Bowen, secretary of the company, and J. S. Barbour, its general counsel. Mr. Bowen said that his attention had been called to the individual contract by President King in the summer of 1916. He looked into the matter and passed a draft of it to Mr. Barbour. Mr. Barbour said that he had gone over the draft as presented to him by Mr. Bowen; that he had offered suggestions for changes, and that from that time on he had not seen the contract or discussed it with any of the officers of the company until it was presented to the men. Another feature taken up at this session was the question of representation of the public on the board of directors of the company. Mr. Barbour thought that the interests of the public were well cared for by the Public Utilities Commission.

Mr. Bowen was again a witness on May 26. He said that he could not advocate collective bargaining which recognized the right of the men to strike in a body. He considered that employees of a public utility had no more right to strike in a body than had government employees.

At the hearing on May 29, at which President King was a witness, Senator Pittman, chairman of the investigating committee, said that it seemed to him that the company was contending that it was willing to enter into a collective agreement with the men if the union could be eliminated and at the same time knew that the union dominated the situation and could not be eliminated. George P. Hoover, counsel for the company, insisted that Senator Pittman was drawing a wrong conclusion from the testimony. Mr. Hoover contended that the company had been ready to go forward in good faith under the agreement of 1916; that the union had violated the agreement in issuing the pamphlet in which it stated that the company had entered into an agreement with the union, when it had not done so, and that the union had attempted to force non-union men into the union. He insisted that there had been no deviation in the policy of the company.

PRESIDENT KING FAVORS STRIKE PREVENTION LEGISLATION

President King was a witness again on May 31. He was in hearty accord with the sentiment of Senator Pittman that it seemed desirable for Congress to take up the question of legislation calculated to prevent strikes in the future in the District. Mr. Vahey for the union read into the record the individual contract of the Indianapolis Traction & Terminal Company with its men. Mr. King admitted that it was substantially the same as that of the Washington Railway & Electric Company. He said that he knew about the Indianapolis situation and told Mr. Bowen, secretary of the company, to inquire into the matter.

There was no session of the committee on June 4. On June 5 Mr. Ham went into the matter of the re-employment of a motorman who had been in an accident, and employees of the company who had long been in its service reviewed the conditions under which they have worked.

Chicago Traction Bills Passed

Four Bills Before State Legislature Passed by the Senate and Now Before the House

The thirty-year franchise bill for Chicago, the bill permitting the merger of the surface and elevated lines, the home-rule bill and the bill giving the city the right to construct subways have all passed to the third reading in the State Senate. There was little discussion of these bills at the third reading either by the supporters or by the opposition, and in no case was the necessary vote of twenty-six registered in favor of the bills.

The test vote permitting the merger of the surface and elevated lines went through the third reading by a vote of twenty-four to four. A similar test vote during the consideration of the home-rule bill resulted in its approval by a vote of twenty-four to seven. This measure had previously been amended to apply to the transportation interests in Chicago only and thus leave the other utilities under State control.

Former Governor Dunne and a delegation from Chicago who were opposing the traction plans were questioned by Walter L. Fisher, special counsel for the Chicago local transportation committee. Mr. Fisher argued in favor of the bills as offering the most promising immediate solution of the Chicago traction congestion. Mr. Dunne charged that the purchase price of $70,000,000 fixed for the elevated roads by the Traction & Subway Commission was excessive by at least $7,000,000, on which amount the city would be required to guarantee 6 per cent interest under the consolidation plan.

All four Chicago traction bills were passed by the State Senate on June 6. The vote on the measures was as follows: Home rule, twenty-eight to six; franchise, twenty-seven to fourteen; merger, twenty-six to eleven; subway, forty to five. It was intended to report the bills to the House on the morning of June 7. If the measures are passed by the House negotiations will be resumed with the City Council. Considerable time will probably elapse before a final ordinance is agreed upon. The ordinance so drafted must then go to a referendum vote.

Bids Asked for Cascade Electrification

The electrification department of the Chicago, Milwaukee & St. Paul Railway at Seattle, Wash., recently sent out specifications for the electrical equipment, including locomotives, generators, etc., to be used in the electrification of the Cascade Mountain division, from Cle Elum west to Seattle and Tacoma. It is expected bids for this equipment will be in by July 1. In calling for bids the company specified that delivery must be made as early as possible, in order that the division may be completed and in operation by Oct. 1, 1918.

Seattle Bridge Conference Results

Some Recent Matters Up for Settlement Between Street Railway and City Reviewed Briefly

The City Council of Seattle, Wash., is considering an ordinance introduced by Councilman Oliver T. Erickson, fixing the rental to be charged the Puget Sound Traction, Light & Power Company for the use of bridges across Lake Washington Canal, at Fremont Avenue, Fifteenth Avenue, N. W., Tenth Avenue N. E., and across the West Waterway at West Spokane Street. The bill tentatively fixes the rental for the use of the Fremont Avenue bridge at $804 a month, plus the cost of current used for the operation of cars over the bridge at the rate of 1 cent a kilowatt-hour. A. H. Dimock, city engineer, and A. L. Valentine, superintendent of public utilities, in a recent report, recommended a rental of $7,586 a year, plus one-third of the cost of maintenance, or about $633 a month. Mr. Erickson's bill also provides that if another street railway or the city itself should use the bridge for street railway purposes a pro rata amount shall be paid by the new tenant of the bridge, based on the number of cars in service.

CITY ABANDONS FIGHT

The city's fight for common user rights on Third Avenue with the Puget Sound Traction, Light & Power Company was virtually abandoned with the submission to the Council of the report of the conference committee, headed by Councilman Erickson, and the reference of the recommendations of the conference committee to the franchise and city utilities committees. The report indicates that nothing was accomplished at the several conferences with the officials of the Puget Sound Traction, Light & Power Company. A. W. Leonard, president of the company, refused to consider any proposition that included common user rights for the city lines on Third Avenue. The recommendations made by the committee follow:

"The corporation counsel, after a careful study, is of the opinion that the city may tender a rental proposal for crossing the Fremont Bridge, but that it could not be enforced, notwithstanding the company has refused to pay any portion of the cost of the bridge. He suggests that two methods of procedure are open for consideration. One is to revoke the company's franchise for failure to comply with its provisions. The other is to formulate a demand for a fair lump sum proportion of the total cost and a monthly contribution for maintenance and operation based on the franchise, and to bring suit in the case of refusal. In order that the company may have a rental proposal to consider, an ordinance of that sort has been prepared for introduction.

"The revocation of the company's franchise has not been considered by your committee. Such action presents many angles. Although the company has refused to comply with nearly all of its obligations, revocation may not be the best method of proceeding. The matter of enforcing a lump sum contribution with monthly charges for maintenance and operation will be considered while the rental ordinance is pending.

"In the matter of securing running rights on Third Avenue, the corporation counsel advises that it may be done by condemnation. This method would be tedious and the terms to be secured are an unknown quantity. Furthermore, we have already secured such rights on Fourth Avenue and would therefore recommend that further negotiations with the company on this matter be dropped."

"Times" Tackles Toledo Traction

Paper Discusses Local Traction Muddle in Terms Uncomplimentary to City Officials

The Toledo (Ohio) *Times* continues to discuss the street railway situation in terms that are far from complimentary to the Street Railway Commission and Mayor Milroy. It urges that something can and should be done at once to settle the controversy and that the city cease to await the pleasure of the commission in making its report to the Mayor. The paper doubts the feasibility of the community plan which has been worked out by the commission and believes that a substantial business proposition of some kind should be presented to the city.

The commission has never made a report of its work to Mayor Milroy and has as yet fixed no time for giving him official information along this line. The *Times* considers this as discourtesy. It argues that both the Mayor and the people are entitled to official information as to what has been done and should not be forced to depend upon newspaper reports. Two members of the commission are, by the way, the heads of Toledo papers.

The *Times* says that excess fares are being collected through the suspension of the workmen's 3-cent hours. This means that $700 a day is being collected from workingmen and transferred to the company's treasury. Of this one-half goes to a fund for the purchase of cars and for improvements, while the other is absorbed in an increase in the wages of motormen and conductors. The *Times* estimates that this excess, since April 10, 1916, aggregates $287,700, or a return of 6 per cent on a capitalization of $4,250,000. The *Times* does not criticize the company, but it does argue that the business should be placed upon a substantial and permanent basis of some kind.

PAPER RAPS TOLEDO COMMISSION

In commenting recently on the Street Railway Commission and its work the *Times* published the following editorial:

"The hostile attitude exhibited by Johnson Thurston toward the Rail-Light is so utterly at variance with the attitude of his 'co-commissioners' that it is evident there is no longer harmony within the organization. The *Times* has suspected as much for some time.

"It is apparent now that the 'car commission' as constituted will never agree on an ordinance to be submitted to the people and, this being the real state of affairs, Mayor Milroy should promptly relieve it from further duty. Then, if he is still of the opinion he expressed just after his election, he should try again. If he has kept in close touch with the street car situation of Toledo he should know that conditions are even worse than they were when he first appointed the committee. The car riders are not getting any better service and they are paying more for it. What they want is improved service and lower fares. The Dotson ordinance provided both. It was defeated largely through the efforts of the men who, because they claimed to know how to draft a better ordinance, were called upon by the Mayor to do the work. They have been at it intermittently for seventy-nine weeks and have produced nothing. There is no visible evidence that they intend doing anything. Whether they have deadlocked with Henry or with one another is immaterial. They have been on the job quite long enough to prove that they are either inefficient or disloyal to the city.

"What are you going to do about it, Mr. Mayor?"

On the evening of May 28 the City Council adopted the resolution providing for an amendment to the city charter which will allow the issuance of bonds for the purchase of the street railway property. The plan contemplates an issue of $1,500,000 of bonds, from the proceeds of which a cash payment will be made. There will be another issue of similar amount which the company will be asked to accept. The amendment to the charter is to be voted on at the August primaries, while the question of issuing the bonds will be placed before the voters at the November election. In the meantime the city will be asked to furnish funds to provide for a valuation of the property.

Relief Opposed in Rhode Island

Thomas Walsh, chairman of the committee on railroads of the City Council of Providence, R. I., has announced that the committee will oppose any plan for the city to release the Rhode Island Company from any of its many financial obligations. His statement followed a meeting of the committee held on May 31. Mr. Walsh said:

"The committee has decided absolutely against any change in the financial conditions of the franchise of the Rhode Island Company. The decision is final. No report will be made to the City Council, for we have nothing to recommend."

The obligations from which the company asked to be excused call for the payment annually of approximately $200,000 into the city treasury. The records of the city auditor show the following payments for last year: franchise tax, 5 per cent of gross receipts, payable quarterly, $110,000 a year; annual payment for sixty years, of interest at 4½ per cent, on one-third of the cost of widening streets, $35,000 a year; maintaining parts of the streets between rails, $50,000 a year.

Storm Stops Interurban Service

In the recent tornado which swept southern Illinois and caused great ruin in Mattoon and Charleston, the city lines in Mattoon and the interurban railway connecting Mattoon and Charleston, both owned by the Central Illinois Public Service Company, were more or less damaged. Service was restored on the city line within a few hours after the storm had passed since only a small amount of overhead construction was damaged. Trees blown across the tracks had to be removed.

On the interurban line, however, nearly 50 per cent of the pole lines which carried the overhead construction and a three-phase transmission line connecting Charleston and Mattoon was blown down. A car which was on the line happened to be in a cut during the worst of the storm and received practically no damage. Service was restored over a portion of the interurban line on June 1, and through service between Charleston and Mattoon was begun on June 3.

The power house at Mattoon escaped injury. The station at Charleston was rather badly damaged. The walls and roof collapsed and the stack was blown over, but practically no damage was done to the station equipment. Service was restored in this plant on June 1.

Commission to Govern City Utilities

Cincinnati Rapid Transit Commission Seeks Jurisdiction Over All Utilities in the City

At a meeting of the Rapid Transit Commission of Cincinnati, Ohio, on June 1 a resolution was adopted requesting the New Charter Commission to include in the proposed city charter a provision clothing the Rapid Transit Commission with supervision of all public utilities. Chris Schott, who submitted the resolution, and E. H. Dornette were appointed as a committee to confer with City Solicitor Groom and Frederick S. Spiegel, counsel for the commission, as to the legality of such a provision. Should there be no legal obstacles, the committee will appear before the Charter Commission to recommend its adoption. While the Cincinnati Southern Railroad, which is owned by the city, is not mentioned in the resolution, it is understood that it will be included with other utilities as coming under the supervision of the commission, should the Charter Commission adopt the plan.

Chairman E. W. Edwards of the Rapid Transit Commission and Chris Schott constitute a committee which will urge delay in granting the Cincinnati, Newport & Covington Street Railway a franchise until it can be determined whether the proposed tracks on Walnut Street south of Third Street will interfere with the construction of the loop tracks.

Frank S. Krug, chief engineer of the commission, reports that he has a force of men making measurements of foundations of buildings on Walnut Street along the proposed subway route.

Arbitration in East St. Louis

This Method Adopted After Conferences Between Company Officials and Men Fail

A conference of the Mayors of several East Side cities, called by Mayor Mollman of East St. Louis for June 1, averted the threatened strike of 600 motormen and conductors of the East St. Louis & Suburban Railway, the employees of which had voted to walk out at 5 a. m. on June 2. The conference was held in the City Council Chamber, East St. Louis. It was attended by the officials of the railway, representatives of the car men's union, the Mayors of Alton, Edwardsville, Collinsville, Belleville and other East Side towns touched by the system. Both sides agreed to arbitrate the differences. Each side is bound to accept the finding of the committee. The committee is composed of Al Towers, representative of labor in Belleville, Ill., for the employees, and C. E. Smith, a civil engineer of St. Louis, for the officials. It was expected that a third arbitrator would be selected later.

The motormen and conductors wanted the flat rate system continued. This method of payment has been in effect since the lines of the East St. Louis & Suburban Railway were built. The officials of the company wanted to put a sliding scale into effect by which new men would receive less than veteran employees. The company contended that a man who had worked for years knew his run and his passengers and was worth more than a new man. The employees argued that if the old timers were paid the top wages they would be the first to go in case of a desire on the part of the company to reduce expenses. The question of wages is practically the only one for the committee to decide. At present all conductors and motormen on the local lines are paid 27 cents an hour and work between nine and ten hours. The men working on the interurban lines are paid 28 cents an hour. The local men are asking for 38 cents an hour and the interurban men for 48 cents an hour.

At the conference on June 1 Mayor Mollman of East St. Louis told the railway officials that the men were decidedly opposed to a sliding wage scale. He pleaded with the company because of the general industrial unrest on the East Side, not to delay a peaceful settlement by insisting on a sliding scale. After consultation the officials announced they would eliminate this feature from consideration. The representatives of the railway and of the motormen and conductors have been conferring for several weeks. A two-year working agreement between the company and car men expired on May 1. Heretofore this has been renewed within ten days.

C. E. Smith, selected by the officials of the railway as their representative on an arbitration committee, and Al Towers, chosen by the employees of the road to look after their interests, are holding daily conferences in an effort to settle the differences between the railroad officials and the employees. Up to June 7 the third member of the committee had not yet been named and no third party will be named if the differences can be adjusted without one. Thus far, however, there has been no indication of the possible outcome of the conferences between the two arbitrators. Meanwhile the operation of the railway line is being continued as usual.

Rapid Transit Progress in New York

The Interborough Rapid Transit Company contemplated the beginning of service on the West Farms connection between the Second and Third Avenue elevated lines and the West Farms branch of the first subway on June 1, but found it necessary to report to the Public Service Commission for the First District that this operation must be postponed for upward of a month. After an examination of the new line operating officials of the company informed the commission that they deemed it unwise to begin operation without a complete set of signals to govern the running of the Second Avenue express trains which in the morning and evening rush hours will use this connection.

The Public Service Commission for the First District recently directed that operation of a portion of the new Jerome Avenue elevated line in the Bronx should begin on June 2 at 2.30 p. m. The portion placed in service is part subway and part elevated railroad and extends from 149th Street and Mott Avenue north to Kingsbridge Road and Jerome Avenue. It is expected that the whole line will be placed in service in the fall in connection with the new Lexington Avenue subway, of which the Jerome Avenue branch is a part. The Lexington Avenue line forks in the vicinity of 135th Street and one branch extends to the eastward to Pelham Bay Park, while the other reaches north under Mott Avenue and other thoroughfares as a subway to 157th Street and thence extends as an elevated railroad over River and Jerome Avenues to Woodlawn Road and Van Cortlandt Park. It was arranged that regular passenger service should be begun immediately, passengers obtaining access to the line by way of the Mott Avenue station of the first subway, which is adjacent to the 149th Street station of the Jerome Avenue line.

Subway travel from the Pennsylvania Station to Times Square is possible now. A completed spur on the new Seventh Avenue line between those points was opened to the public on June 4. By use of the new spur the Grand Central Terminal and the Pennsylvania are brought nearer together, as passengers on one fare with little inconvenience can go from or to the old subway at the Times Square station, where a transfer station has been established.

The north headings of the new subway tunnel between Whitehall Street, Manhattan, and Montague Street, Brooklyn, were joined underneath the East River on June 2. The south headings will be "holed through" and joined within the next two or three weeks, according to reports made by engineers to the commission. This tunnel, which will eventually be operated as a part of the Broadway-Fourth Avenue subway system by the New York Consolidated Railroad, Brooklyn, has been under construction since 1914. A little less than a year more must elapse before the tunnel is completed and ready for operation. With the headings of the Whitehall-Montague Street tunnel joined, two of the four new rapid-transit tunnels under the East River being built as a part of the dual system of rapid transit will be well on the way to completion.

Conference Held in Philadelphia

The suggestion of Senator McNichol made at Harrisburg, Pa., on May 29 in regard to the pending transit bills for Philadelphia has been adopted. He recommended at that time that the representatives of the city and the Philadelphia Rapid Transit Company get together and confer further with respect to the differences between them. The first of these renewed conferences looking toward an agreement for the operation of the city-built high-speed lines was held on June 1. It was participated in by E. T. Stotesbury, Ellis Ames Ballard, and A. L. Drum for the company and Joseph Gaffney, chairman of the finance committee of the Councils; City Transit Director W. S. Twining and William Draper Lewis, the city's legal adviser, for the city. They engaged in what was said to be a "full, frank, free and friendly discussion" of the points at issue and the pending legislation. The result was announced to be "satisfactory progress for the city's interests."

Increase in Wages on Morristown Line.—The wages of all the employees of the Morris County Traction Company, Morristown, N. J., except the executive heads have been increased about 10 per cent.

Kansas Road to Purchase Power.—A contract has been closed by which the Union Traction Company, Coffeyville, Kan., will purchase energy from the Kansas Gas & Electric Company, which has power plants at Independence, Cherryvale and other points.

Increase in Wages in Davenport.—Employees of the Tri-City Railway, Davenport, Iowa, will soon receive an increase in wages of 1 cent an hour, effective on June 1. Under the new scale trainmen will receive 27 cents an hour the first year, 28 cents an hour the second year and 32 cents an hour the third year. For overtime the men receive the regular scale plus 7 cents an hour.

Seek a Voluntary Increase in Wages.—Officials of the local branch of the Amalgamated Association at Cleveland, Ohio, are preparing a table of price increases on foodstuffs since the contract of the men with the Cleveland Railway was signed in May, 1916, with the idea of showing the company why a voluntary increase in wages should be made. Under the contract the men received an increase of 1 cent an hour, beginning with May 1, this year.

Summer Engineering Courses at Wisconsin.—The nineteenth annual summer session of the College of Engineering of the University of Wisconsin will be held at Madison during the six weeks' period beginning June 25. Special courses will be given in chemistry and in electrical, steam and hydraulic engineering, gas engines, machine design, mechanical drawing, mechanics, shop work and surveying. All the courses are open to engineering students.

Electric Operation of Corvallis Line on July 1.—The work of completing the electrification of the 40 miles of line of the Southern Pacific Company between Whiteson and Corvallis, Ore., has been further delayed by inability of the manufacturers to deliver the electrical apparatus. According to J. H. Dyer, assistant general manager of the company, the line will be ready for electric service about July 1 unless some delay not now apparent should arise.

Preparing for Arbitration at Alliance.—Charles R. Morley, president of the Cleveland, Alliance & Mahoning Valley Railway and the Stark Electric Railway, has selected J. H. Alexander of the Cleveland (Ohio) Railway as arbitrator in the wage dispute which was one of the factors in the strike recently settled. The men demanded an increase of 5 cents an hour. President Morley offered an increase of 2 cents an hour to the men on the Cleveland, Alliance & Mahoning Valley Railway and 3 cents an hour on the Stark Electric Railway.

Increase in Wages in Phoenix.—Word was received at Phoenix, Ariz., on May 16, that the increase in wages of 5 cents an hour asked for by the employees of the Phoenix Railway has been granted by Gen. M. H. Sherman, president of the company, in Los Angeles, as a result of conferences with S. H. Mitchell, general manager. General Sherman is reported to have stated that while the resources of the company would not permit the increase, he would send his personal check to cover the increase for a period of three months, during which time it is hoped that a plan to make the advance permanent may be worked out.

Condemnation of Duluth Line Threatened.—Immediate steps for the condemnation of the Duluth (Minn.) Street Railway, under the exercise of the right of eminent domain, have been ordered by the Duluth City Commission. Frank Crasweller has been appointed a special attorney for the city to take whatever steps may be necessary to carry the commission's resolution into effect. The resolution provides for payment of "a fair price as a going concern." The action by the city in this connection is generally regarded as a counter move by the city in the so-called 10-cent fare case involving suburban lines, to which reference has been made previously in the ELECTRIC RAILWAY JOURNAL.

Rushing the Railroad Rate Hearing.—Testimony in the railroad rate hearing is proceeding before a special examiner, as well as before the full Interstate Commerce Committee, and the hearings on the petition of the railroads for a 15 per cent advance in freight rates are being rushed to allow all the parties to put in appearances before June 7, when the case against the carriers is to be closed. Next week representatives of shippers in diversified industries from several sections, as well as state railroad commissions, will present additional protests, and on Thursday and Friday the carriers will introduce testimony in rebuttal. Final arguments for all interests will be heard June 9, 11 and 12.

Further Seattle Bridge Conferences Probable.—As an alternative to a suit against the Puget Sound Traction, Light & Power Company, Seattle, Wash., the majority of the members of the City Council has agreed to a proposal that the company pay $1,000 a month for the use of the Fremont Avenue bridge. This included $804 a month as a rental equivalent to the company's share of construction and $196 for the cost of operation. It is possible that the new proposal will result in a renewal of conferences between the company, on one hand, and the Councilmen, Superintendent of Public Utilities A. L. Valentine, and Corporation Counsel Hugh M. Caldwell on the other. At the committee conferences Councilman R. H. Thomson alone dissented. He expressed doubt as to whether the company could in fairness be charged for the operation of the bridge.

Public Service Commission for Porto Rico.—Congress, by an act approved on March 2, 1917, provided for a public service commission in Porto Rico. A new Legislature and the public service commission for which provision has been made will be organized on Aug. 13, 1917. This public service commission will supersede the executive council and the committee on franchises and public service corporations in the granting of franchises, privileges and concessions, and will have jurisdiction over rates, rules and regulations, service and protection from competition. The public service commission will be formed by the following six heads of Porto Rican departments: Attorney general, treasurer, commissioner of the interior, commissioner of education, commissioner of health and commissioner of agriculture and labor, together with the auditor of Porto Rico, who under the law is not considered as a head of department, and two commissioners to be elected by the voters of Porto Rico, a total of nine. The commission will choose its own personnel.

Sixty-ninth Street Terminal, Philadelphia, to Be Improved.—Increased terminal facilities for West Philadelphia and a station almost twice the size of the present Sixty-ninth Street terminal are projected by the West Chester Traction Company and the Philadelphia Rapid Transit Company. A new station that will handle twice the number of persons, eight tracks for the West Chester Traction Company in place of the five now in use, expansion and extension of the Philadelphia Rapid Transit Company terminus and moving the West Chester turnpike 60 ft. to the south are some of the improvements contemplated to handle the increasing growth of traffic at the point where Delaware County adjoins the city. To increase the size of its terminal required the purchase of additional land to the south of West Chester turnpike. Some of the property holders demanded such a price for their land that the company was forced to begin condemnation proceedings. The Sixty-ninth Street station is one of the most important suburban electric railway terminals in the East.

Norfolk Franchise Conferences Resumed.—Several conferences have been held recently at Norfolk, Va., between representatives of the City Council and officers of the Virgina Railway & Power Company. The first of these was between officials of the company and members of the gas and electricity committee. Henry W. Anderson, counsel for the company, saw no hope for a readjustment of the light and power rates downward. He predicted an increase of $500,000 in operating costs to the company in Norfolk alone for the coming year. At a subsequent meeting with members of the franchise committee Mr. Anderson was asked to prepare a definite proposition that would embrace universal transfers, uniform paving obligations and a rerouting plan. The city, on the other hand, if members of the committee voiced the sentiments of the Council, would be willing to abandon its request for six tickets for a quarter, and would concede abolition of reduced fares. Partly to compensate for the expense of uniform transfers and the construction of new lines, regulation of jitneys was promised.

Program of Association Meeting

Central Electric Railway Accountants' Association

Under date of June 5 President O. A. Small of the Central Electric Railway Accountants' Association sent the following letter to members:

"After due consideration by the officers and executive committee the meeting scheduled to be held in Fort Wayne, Ind., on June 8 and 9 is hereby cancelled.

"In the cancelling of this meeting the officers and executive committee of the Central Electric Railway Accountants' Association do not intend that the organization will be of any less value to its members than it has been heretofore, but that the energy of the association will be devoted to the various problems which present conditions have presented before us."

Financial and Corporate

Annual Reports

Newport News & Hampton Railway, Gas & Electric Company

The income statement of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., for the year ended Dec. 31, 1916, follows:

Railway revenue	$414,518
Gas revenue	142,779
Electric light and power revenue	253,891
Ice revenue	202,523
Total operating revenues	$1,013,711
Railway expenses	$229,824
Gas expenses	75,425
Electric light and power expenses	109,896
Ice expenses	143,397
Total operating expenses	$558,542
Net operating revenues	$455,169
Taxes	35,519
Operating income	$419,650
Non-operating income	3,273
Gross income	$422,923
Income deductions	234,491
Net income	$188,432

The total operating revenues of the company in 1916 showed an increase of $97,540 or 10.65 per cent over those of 1915, while the net operating revenues gained $63,503 or 16.21 per cent. The earnings in all departments showed increases because of good business conditions in the company's territory, owing to activity in shipbuilding and shipping. The revenues of the railway department increased $58,895 or 16.56 per cent in 1916, while the operating expenses rose $2,574. The gas revenues gained $9,860 or 7.42 per cent; the electric light and power revenues, $39,112 or 18.21 per cent, and ice revenues, $18,672 or 10.16 per cent.

The operating expenses of the combined departments rose $34,036 during the year, but the operating ratio fell from 57.25 per cent in 1915 to 55.09 per cent in 1916. The gross income gained $57,048 or 15.59 per cent, while income deductions decreased slightly on account of the retirement of bonds. As a result the net income showed a gain of $58,468 or 44.98 per cent. Of this $71,208 or 7.03 per cent of the gross revenues was credited to the reserve for depreciation, extraordinary renewals or purchase of bonds, as compared to $25,079 in 1915. The capital expenditures in 1916 were $151,671, of which $102,239 was for the railway.

North American Company

The comparative income statement of the North American Company, New York, N. Y., for the calendar years 1915 and 1916 follows:

	1916	1915
Interest received or accrued	$450,131	$488,804
Dividends received	1,824,278	1,438,028
Profits and compensation for services	29,920	28,671
Total	$2,304,329	$1,952,503
Salaries, legal expenses, net rentals and all other administrative expenses	$77,961	$77,780
Taxes	33,334	10,576
Interest paid or accrued	17,491	25,821
Sundry accounts written off and reserves	13,625	33,549
Total	$142,411	$147,726
Net income	$2,161,918	$1,804,777
Dividends paid and accrued during year	1,489,665	1,489,666
Balance carried to undivided profits account	$672,253	$315,111

The gross income of the North American Company from its holding of stocks and bonds of the various electric light and power and electric railway companies showed a good gain in 1916, and after providing for all expenses and interest charges, the company earned 7.25 per cent on its capital stock as compared with 6.05 per cent in 1915.

Business conditions in the territories in which the company is interested showed a substantial improvement, but the subsidiaries had to bear increased expenses.

In the Wisconsin group the two companies of interest in the electric railway field are the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company. The operating revenues of the Milwaukee Electric Railway & Light Company for 1916 amounted to $6,961,151, an increase of $989,436 or 16.57 per cent. The operating expenses, taxes and reserves increased $766,442 or 18.40 per cent, and interest charges decreased $34,176 or 4.31 per cent, so that the net income increased $305,021 or 29.25 per cent. The increase in operating revenues in the railway department was $700,455 or 17.91 per cent. Expenditures for construction during the year amounted to $1,005,631.

The operating revenues of the Milwaukee Light, Heat & Traction Company for 1916 amounted to $1,852,071, an increase of $371,446 or 25.09 per cent. Operating expenses, taxes and reserves increased $288,648 or 29.14 per cent, and the net income decreased $178,754 or 33.98 per cent. The increase in operating revenues in the railway department was $144,252 or 16.70 per cent. The expenditures for construction during the year were $286,482.

To take up the railway property in the Missouri group, the United Railways of St. Louis, it may be said that the operating revenues of this company for 1916 amounted to $12,641,293, an increase of $960,093 or 8.22 per cent. The operating expenses, including taxes and reserves, increased $376,933 or 4.23 per cent, and the interest charges rose $54,712 or 2.10 per cent, so that the net income increased $621,977 or 234.24 per cent. Expenditures for new construction during the year amounted to $283,420.

During the year the securities owned by the North American Company were revalued by a committee. The amount at which the 184,000 owned shares of common stock of the United Railways of St. Louis was carried on the holding company's books was reduced to $1. The net decrease in book value was $2,600,000, which was charged to the "contingent security depreciation reserve" created in 1914, leaving a balance of $50,000 to the credit of such reserve.

Canadian Earnings for 1916

According to the annual returns to the Comptroller of Statistics, the gross earnings from operation of Canadian electric railways for the year ended June 30, 1916, totaled $27,416,284. The gross in 1915 was $26,922,899, so that the last year showed a gain of $493,385 or 1.8 per cent. The 1916 result was still less than that of 1913 or 1914, but greater than that of any preceding year.

In 1915 the passenger earnings had decreased $2,301,639 or 10.9 per cent, and the freight earnings $141,869 or 12.6 per cent. This showing, however, was bettered in 1916, for the passenger earnings gained $57,639 or 0.3 per cent and the freight earnings $236,722 or 24.1 per cent. All the other earnings items showed increases with the exception of the rent of land and buildings and the sale of power. The latter dropped $44,866 to a total of $59,325.

The operating expenses for 1916 at $18,099,905 represented a decrease of $31,937 or less than 0.2 per cent. The operating ratio in 1916 was 67.24 per cent as compared to 67.40 per cent in 1915. The details of operating expenses were not received from certain corporations, items being lacking for $3,713,996 of the operating expenses in 1915 and $3,707,053 in 1916. With this in mind, it may be pointed out that in the last year maintenance of way and structures decreased $78,346 or 7 per cent; maintenance of equipment $186,662 or 12 per cent, and operation of cars $180,272 or 2.5 per cent. On the other hand, operation of power plant increased $73,662 or 2.5 per cent, and general expenses $346,624 or 19 per cent.

The net earnings from operation for 1916 at $9,316,379 showed a gain of more than 6 per cent. After adding $2,928,573 for miscellaneous income and making deductions of $7,358,283, the net income amounted to $4,886,669. Reserves took up $1,535,071 of this, and dividends $2,834,906, so that the surplus for the year totaled $516,690.

The number of fare passengers carried in 1916 was 580,094,167, as compared to 562,302,373 in 1915. The total of freight hauled was 1,936,674 tons, as compared to 1,433,602 tons in the preceding year. The paid-up capital for 2248.57 miles of single track in 1916 was $154,895,584, as compared to $150,585,342 for 2102.95 miles in 1915.

Report of Virginia Commission

The total transportation revenue of the nineteen electric railways under the supervision of the State Corporation Commission of Virginia amounted to $5,083,341 for the fiscal year ended June 30, 1915. This showing involved the following decreases: Passenger, $384,087 or 7.42 per cent; parlor, dining, special and baggage, $7,336 or 41.70 per cent; mail, express, milk, switching and miscellaneous, $16,629 or 24.87 per cent, and freight, $95,822 or 29.61 per cent. Revenue from other railway operations fell off $23,710 or 29.87 per cent, and the total revenue decreased $527,587 or 9.31 per cent.

The total operating expenses decreased $320,128 or 9.14 per cent to $3,181,576. Maintenance of way and structures dropped $51,535 or 10.04 per cent; maintenance of equipment, $85,607 or 21.13 per cent; conducting transportation, $539,619 or 28.35 per cent, and traffic, $14,493 or 28.69 per cent. The net income for the year at $1,164,671 showed a gain of $17,809 or 1.55 per cent. The total number of passengers carried was 113,194,803, the revenue passengers being 95,895,127. The average fare for all passengers was 4.016 cents, a decrease of 0.024 cent, while the average fare for revenue passengers was 4.741 cents, a decrease of 0.029 cent.

Maine Income Gains Slightly

The net income of the electric railways in Maine for the year ended June 30, 1916, showed a slight increase from $629,448 to $632,025. The dividends declared rose from $402,797 to $419,347, the percentage on capital stock increasing from 2.50 to 2.59 per cent. These figures are taken from the second annual report of the Maine Public Utilities Commission.

The operating revenues of all the companies totaled $3,102,357 in the last fiscal year, with operating expenses amounting to $2,033,587. The surplus increased from $849,334 in 1915 to $958,215 in 1916. Other comparative data regarding capitalization and income are presented in the accompanying table.

CAPITAL STOCK, INDEBTEDNESS, GROSS REVENUES LESS OPERATING EXPENSES (GROSS INCOME) AND DISPOSITION OF GROSS INCOME OF MAINE ELECTRIC RAILWAYS

Name	Capital Stock	Funded Debt	Other Interest-bearing Debt	Gross Income	Interest Deductions	Other Deductions Prior to Distribution to Stockholders	Net Income	Dividends Declared
Androscoggin Electric Company	$2,000,000	$3,140,500	......	$287,130	$156,357	$1,753	$129,019	$37,500
Aroostook Valley Railroad	256,400	887,432	......	43,303	46,888	......	*3,585	......
Atlantic Shore Railway	1,000,000	2,477,250	......	60,710	118,475	......	*57,764	......
Bangor Railway & Electric Company	3,499,936	2,599,000	......	358,223	129,873	89,961	138,388	144,997
Benton & Fairfield Railway Company	20,000	33,000	......	1,948	1,650	......	298	......
Biddeford & Saco Railroad	100,000	150,000	......	18,212	6,000	......	12,312	10,000
Calais Street Railway	100,000	100,000	......	10,131	5,000	......	5,131	5,000
Cumberland County Power & Light Company	4,996,800	5,339,000	......	932,589	254,180	413,546	264,861	138,000
Fairfield & Shawmut Railway	30,000	30,000	$1,000	1,660	1,560	......	100	300
Lewiston, Augusta & Waterville Street Railway	3,000,000	3,659,000	6,000	261,538	179,482	12,916	69,139	36,000
Oxford Electric Company	80,000	166,000	......	15,948	6,917	12	9,018	4,065
Rockland, South Thompson & St. George Railway	......	......	......	......	......	......	......	......
Rockland, Thomaston & Camden Street Railway	400,000	800,000	20,000	75,055	32,971	90	41,993	20,000
Somerset Traction Company	30,000	75,000	48,050	1,591	2,290	......	*698	......
Waterville, Fairfield & Oakland Railway	500,000	......	......	25,351	......	......	25,351	23,485

*Deficit.

Indiana Tax Figures

The State Tax Board of Indiana, which has just completed its first spring session, shows the total valuation of interurban railways of the State as $26,228,335, a decrease of $113,366 under the 1916 valuation. The interurban lines show a total loss of 17.47 miles of main track in 1917 over 1916 and a gain of 15.97 miles of second main track. A gain of 9.71 miles of side track was reported and a loss of 18.50 in rolling stock mileage. These figures resulted in money valuation gains and losses as follows: Main track, $243,038 loss; second main track, $102,080 gain; side track, $28,500 gain; rolling stock, $628 loss. The total improvements on right-of-way were valued by the board at a loss of $280 over last year's total. The total valuation of interurban improvements on right-of-way this year was $1,106,877. Only three interurban railways were raised in valuation on main track, the Hammond, Whiting & East Chicago Railway, the Interstate Public Service Company and the Southern Michigan Railway. The Indianapolis Traction & Terminal Company was valued at an increase of $85,338 over last year, due to natural increase in trackage. The Indianapolis Street Railway valuation showed a loss of $150,426, due to a rearrangement of tracks. The Terre Haute, Indianapolis & Eastern Traction Company was valued at $81,543 less than last year's total, due to a shortening of the tracks of the company.

Connecticut Returns for 1916

Total Revenues Increase $1,445,387 and Net Operating Revenue $811,324

The fifth annual report of the Connecticut Public Utilities Commission contains the following summary of operating revenues and expenses of electric railways in the State for the two years ended June 30, 1915 and 1916:

	1915	1916	Increase
REVENUE			
Passenger revenue	$14,063,141	$15,336,166	$1,273,024
Freight revenue	618,387	769,258	150,870
Express revenue	82,589	90,589	8,000
Other transportation revenue	93,419	90,527	*2,892
Station and car privileges	59,062	63,340	4,277
Rent of tracks and terminals	55,347	60,598	5,250
Power	86,178	93,263	7,084
Other operating revenue	40,444	40,217	*227
Total operating revenues	$15,098,572	$16,543,960	$1,445,387
EXPENSES			
Maintenance of way and structures	$1,986,638	$1,859,325	*$127,312
Maintenance of equipment	1,121,545	1,222,640	101,095
Traffic expenses	8,023	18,605	10,582
Conducting transportation expenses	5,615,749	6,189,924	574,175
General and miscellaneous expenses	1,336,427	1,411,951	75,524
Total operating expenses	$10,068,384	$10,702,447	$634,063
Net operating revenue	$5,030,188	$5,841,513	$811,324

*Decrease.

The total operating revenue increased $1,445,387 or 9.5 per cent during the year ended June 30, 1916. All classes of operating revenue showed increases except those from miscellaneous sources. Operating expenses rose $634,063 or 6.3 per cent. Of this increase $574,175 was on account of expenses of conducting transportation. All items in the operating expense group increased except maintenance of way and structures. The net operating revenue for the last fiscal year showed a gain of $811,323 or 16.1 per cent.

The amount paid for taxes of all kinds was $124,871 less than for the year previous, the total amount paid being $971,753. Interest charges on funded and floating debt increased $17,454. With other miscellaneous deductions from income the total deductions for the year were $4,937,704, leaving a net corporate income of $2,846,019. Against this was charged $62,755 for reserve and special charges and $1,355,804 for dividends. The surplus as of June 30, 1916, was $2,691,181, an increase of $491,029 over the surplus of the year before. On the same date the cost of road, equipment and general expenditures totaled $90,759,894, an increase of $286,225. The expenditures on account of leased lines totaled $15,794,327, this amount being an increase of $811,706.

Cleveland Costs Soar

The operating report of the Cleveland (Ohio) Railway for April shows an income of $827,079, an increase of 6.67 per cent over the same month last year. The cost of maintenance was $115,989, or $32,795 more than the allowance. However, a surplus of $5,384 is shown in the operating fund. An increase of 1 cent an hour in the wages of motormen and conductors took place on May 1 and the surplus in the operating fund will in all probability be more than taken up by this. Wages aggregated $28,000 more than in April, 1916.

The number of car-miles operated was 2,888,077, an increase of 7.64 per cent over April last year. The number of passengers carried was 32,499,228, an increase of 6.13 per cent over the corresponding month last year.

Some doubt as to the fate of the interest fund has been caused by the report. It shows a decrease of $9,871 as compared with the March figures and is in contrast with a surplus of $75,305 for April, 1916.

Employment of many inexperienced men is said to be one of the principal causes of the increase in accidents, as shown by the reports of the company for the past several months. Damage claims for April exceeded those of a year ago by $22,366, and for the first four months of the year there was an increase of approximately $80,000 over the same period in 1916.

Permits Railroad Merger

The Thompson bill permitting the merger of railroad corporations under certain conditions was signed by Governor Whitman of New York on June 7. It provides that a business corporation owning two-thirds or more of the capital stock of a railroad corporation or of each of two more railroad corporations, may become a railroad corporation with the consent of the holders of two-thirds or more of the capital stock, and may merge the railroad corporations. The bill also regulates the procedure and the rights of minority stockholders and creditors. The signing of the Thompson bill will permit the consolidation of the surface and elevated roads in Brooklyn and simplify the intercorporate relations between the Brooklyn Rapid Transit Company and its subsidiaries.

American Public Service Company, New York, N. Y.—Confirmation has been obtained of the reported sale of the American Public Service Company to the Insull interests of Chicago. The company controls a number of public utility properties in Texas and Oklahoma, among them the Marshall (Tex.) Traction Company.

Bay State Street Railway, Boston, Mass.—The Bay State Street Railway has been authorized by the Massachusetts Public Service Commission to issue $117,100 of first preferred stock at par, $91,000 of Boston & Northern Street Railway and $27,000 of Old Colony Street Railway 4 per cent bonds, the proceeds to be used to pay floating debt.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—The Illinois Public Utilities Commission has granted permission to the Chicago, North Shore & Milwaukee Railroad to issue $658,000 of first mortgage bonds.

Northern States Power Company, Chicago, Ill.—The Northern States Power Company has completed the purchase of the Northwest Light & Power Company, the Renville County Electric Company and the Minnesota Valley Power Company, all operating in southern Minnesota, communities having an aggregate population of 26,000. The total capacity of the various power stations of the three utilities aggregates 2400 kw. One of the plants is operated by water power, having a capacity of 400 kw., which is capable of being increased to 900 kw. The communities in which the companies operate are connected with the power plants by transmission lines aggregating 200 miles in length, and will be connected into the general transmission systems and large water powers of the Northern States Power Company. The gross earnings of the companies acquired for 1916 were $198,000 and the net earnings $89,000.

San Francisco-Oakland Terminal Railway, Oakland, Cal.—The San Francisco-Oakland Terminal Railway has announced that it has deposited funds with the Wells Fargo Nevada National Bank to pay the coupons due on July 2, 1916, on the general consolidated 5 per cent bonds of the company due Jan. 2, 1933, of the Oakland Traction Consolidated Company.

West Penn Railways, Pittsburgh, Pa.—The Pennsylvania Public Service Commission has ratified the consolidation of the West Penn Traction Company and all its subsidiaries, and the shareholders have been notified that they may now receive in exchange the certificates of the merger company. The capital stock of the new company consists of $10,000,000 of 6 per cent cumulative preferred stock and a like amount of common stock. The officers of the new company are: Samuel Insull, president; John F. Gilchrist, vice-president; Raymond B. Keating, vice-president and secretary; Williston Fish, vice-president; H. S. Swift, treasurer. The plan of consolidation was referred to in the ELECTRIC RAILWAY JOURNAL of May 5, page 845.

Dividends Declared

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¾ per cent, preferred.

Brooklyn (N. Y.) Rapid Transit Company, quarterly, 1½ per cent.

Ironwood & Bessemer Railway & Light Company, Ironwood, Mich., quarterly, 1¾ per cent, preferred.

Memphis (Tenn.) Street Railway, 2½ per cent, preferred.

Tri-City Railway & Light Company, Davenport, Iowa, quarterly, 1½ per cent, preferred.

West Penn Traction & Water Power Company, Pittsburgh, Pa., 1½ per cent, preferred.

Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, AURORA, ILL.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$163,746	*$116,957	$46,789	$35,642	$11,147
1 “ “	'16	154,830	*106,269	48,561	36,528	12,033
4 “ “	'17	633,263	*469,522	163,741	143,088	20,653
4 “ “	'16	594,470	*407,546	186,924	146,225	40,699
BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.						
1m., Apr.,	'17	$85,496	*$73,224	$12,272	$27,716	†‡$15,373
1 “ “	'16	78,445	*73,041	5,404	28,024	†‡22,447
4 “ “	'17	330,978	*287,552	43,426	110,367	†‡66,581
4 “ “	'16	290,842	*267,512	23,330	94,960	†‡70,854
CONNECTICUT COMPANY, NEW HAVEN, CONN.						
1m., Apr.,	'17	$776,809	*$622,600	$154,209	$95,965	‡$80,504
1 “ “	'16	744,170	*546,678	197,492	98,009	‡122,525
4 “ “	'17	3,090,911	*2,470,162	620,749	383,811	‡296,487
4 “ “	'16	2,878,552	*2,050,194	828,358	391,911	‡527,290
FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.						
1m., Apr.,	'17	$219,531	*$148,232	$71,199	$49,574	$21,625
1 “ “	'16	203,175	*135,086	68,089	48,723	19,366
4 “ “	'17	932,456	*603,673	328,783	198,435	130,348
4 “ “	'16	861,788	*574,841	286,947	195,396	91,551
HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.						
1m., Apr.,	'17	$524,053	*$244,504	$279,549	$217,880	$61,669
1 “ “	'16	503,689	*209,981	293,708	214,117	79,591
4 “ “	'17	2,107,514	*954,778	1,152,736	869,179	283,557
4 “ “	'16	1,981,711	*857,506	1,124,205	853,982	270,223
NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.						
1m., Apr.,	'17	$27,447	*$25,821	$1,626	$7,982	†‡$6,294
1 “ “	'16	27.135	*24,098	3,037	7,979	†‡4,903
4 “ “	'17	104,758	*111,210	†6,452	31,943	†‡38,215
4 “ “	'16	98,555	*92,297	6,258	31,940	†‡25,528
NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.						
1m., Apr.,	'17	$48,100	*$43,915	$4,185	§$6,139	†‡$1,167
1 “ “	'16	44,833	*43.965	868	§4,759	†‡2,558
4 “ “	'17	178,628	*185,234	†6,606	§29,002	†‡30,805
4 “ “	'16	162,852	*215,087	†52,235	§26,930	†‡72,679
RHODE ISLAND COMPANY, PROVIDENCE, R. I.						
1m., Apr.,	'17	$459,618	*$423,993	$35,625	$119,610	†‡$57,459
1 “ “	'16	444,826	*311,539	133,287	118,902	†‡41,338
4 “ “	'17	1,827,938	*1,551,858	276,080	477,119	‡144,695
4 “ “	'16	1,735,208	1,353,771	381,437	439,043	†‡1,272
WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.						
1m., Apr.,	'17	$20,254	*$23,573	†$3,319	$2,033	†‡$5,327
1 “ “	'16	20,071	*21,151	†1,080	1,755	†‡2,813
4 “ “	'17	70,666	*88,429	†17,763	8,088	†‡25,744
4 “ “	'16	72,689	*82,369	†9,679	6,951	†‡16,531

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*Includes taxes. †Deficit. ‡Includes non-operating income. §Includes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad, not credited to income of that company.

Traffic and Transportation

Washington Jitneys Without Bonds

Jitney Men Go to Supreme Court for Injunction Against Interference—Some Operate Cars for Contributions

Since the bonds issued by the Casualty Company of America were declared void the jitneys in the State of Washington have continued their fight for permission to operate until satisfactory bonds can be issued. This situation was referred to at some length in the ELECTRIC RAILWAY JOURNAL for May 26, page 980.

An appeal has been made to the Supreme Court from a recent decision of Judge Gilliam denying an injunction applied for by E. A. Hatfield, president of the Seattle Auto Drivers' Union, to prevent Prosecuting Attorney Lundin from prosecuting operators who were without a $2,500 bond as required by law. Hatfield petitioned for an injunction to stay the State's hand following the announcement of State Insurance Commissioner Fishback that the Mutual Union Insurance Company, formed by jitneymen to write surety bonds for the benefit of its members, would not be recognized until a cash security of $250,000 is posted at Olympia. Commissioner Fishback has been ordered by an alternative writ of mandate issued by Chief Justice Ellis to show cause why he does not issue a certificate to the Mutual Insurance Company. He refused to accept notes as assets for the required security. The petition sets forth that in a formal opinion Attorney-General Tanner has held that the members have insurable interest and that the surety bonds can be written if the law is complied with in other respects.

MEN OPERATE "FREE BUSES"

The Puget Sound Traction, Light & Power Company, Seattle, has obtained from Judge Everett Smith in the King County Superior Court, an order to restrain twenty-five jitney drivers from operating along streets included in the company's franchises. As a result of Judge Smith's order, twenty-five jitneys have been operating "free bus" cars for which no fare is solicited, but passengers are expected to "contribute." Inside the cars the following notice is posted: "Donations accepted for our fight with the traction company."

Counsel for the jitney men made an unsuccessful attempt to have Judge Smith dissolve the order. They contended that Judge Gilliam's action in permitting them to appeal to the Supreme Court was a stay to further proceedings. Judge Smith, however, ruled that the criminal proceeding did not bar a civil action and denied the motion. James B. Howe, counsel for the traction company, argued that the company, in bringing suit, was demanding protection of its franchise rights.

The "free bus" plan now used pending the hearing in the State Supreme Court was established as a precedent one year ago in West Seattle, when a jitney driver was arrested for operating without a bond. At a trial in Judge Frater's court, he was fined 1 cent, which Judge Frater announced he himself would pay.

Jitney operators in Spokane have been denied a temporary injunction against city and county officials to forbid the enforcement of the bonding law. In refusing the injunction, Judge Hurn in the Superior Court ruled that the city has authority to regulate street traffic, and that legislative enactment requiring that jitney bus owners give bond is not unconstitutional or prohibitive. The order will require that jitney buses in Spokane cease to operate when the last of the bonds expire in November, unless some means of furnishing bonds is found.

A number of jitney drivers in Everett have been arrested for operating without bonds. Drivers were released on bail. The jitney men in that city plan to join Seattle drivers to take the matter to the Supreme Court.

Portland Election Favorable

Jitney Legislation Most Important Feature of Constructive Program Put Through on Monday

The city of Portland, Ore., went on record decisively for a broad constructive program and sound business administration at the election there on June 4. Commissioner George L. Baker was elected Mayor over Commissioner W. H. Daly, the municipal ownership, union labor, "jitney" and Socialistic candidate. The ordinance requiring a $2,500 jitney bond was carried by 32,000 to 16,000. The charter amendment proposed by the jitney interests to permit free and unrestricted use of the streets by jitneys without franchise or bonds was defeated by practically the same vote as for the bond requirement.

The four so-called "Carver" jitney franchises calling for operation of regular motor-bus service with fixed routes, definite schedules, transfers, heavy bonds and other satisfactory regulations was carried by a heavy vote. These franchises will give the districts now without transportation facilities a service supplementary to, and not competitive with, the street railway lines. The defeat of Mr. Daly, together with the election of two substantial business men for city commissioners and the elimination of unregulated jitney service, which Mr. Daly, as commissioner, has made possible for the last two years, is taken to presage better times for Portland. The ordinance forbidding picketing was passed by a narrow margin.

Atlantic City Jitneys Lose

The jitney men of Atlantic City have continued an uphill fight against the City Commissioners and the Atlantic City & Shore Railway since they were compelled to cease operating on Atlantic Avenue some time ago. Vice-Chancellor Leaming, from whom S. Cameron Hinkle, counsel for the jitney association, obtained a rule to show cause why city authorities should not be restrained from enforcing ordinances excluding jitneys from Atlantic Avenue and raising the jitney license fee to $50 per annum, refused an injunction and dismissed the proceedings. The court's action sustains the contention of Joseph B. Perskie, assistant city solicitor, that the proper recourse for the jitney men is to review the constitutionality of the ordinances before the Supreme Court.

Application has been made by the jitney men to the Supreme Court for a writ of mandamus compelling the City Commissioners to receive the petitions, containing more than 4000 signatures, which call for submission of the ordinances to the people under the referendum clause of the commission government act. The city contends that the ordinances were not drawn under commission plan authorization and consequently are not subject to the referendum test.

New Automobile Law

Recent Legislation in Connecticut Affects Operation of All Motor Vehicles

Connecticut's new automobile law, most of the provisions of which became effective on June 1, is expected to prove helpful in regulating more satisfactorily auto and jitney traffic since it embodies many changes in the old laws. All jitney owners in the future, in addition to paying the regular motor vehicle fees, must obtain a special license at a fee of $2, and operators a special license at a fee of $5. Cities and towns are given the right to regulate jitney routes and public stands. The interior of all jitneys must be lighted at night and no passengers will be allowed to ride on the running boards.

A new rule is established whereby every driver of a motor vehicle must give way at street intersections to any vehicle approaching from the right. This replaces the old rule giving north and south traffic the right of way. Applicants for licenses in the future will have to submit to a road test. A speed of 20 m. p. h. through thickly settled portions, if continued for a quarter of a mile, shall be evidence of reckless driving and 25 miles an hour will be so considered on roads where the houses are less than 100 ft. apart.

All commercial vehicles are required to carry reflectors if their construction is such that a driver's view to the rear is obstructed, and a motor truck must make way for any vehicle approaching from the rear. The fees for trucks have been increased to $100 for each ton above 8 tons.

The new law deals severely with drunken drivers, the minimum penalty for a first offense being the suspension for a year of all licenses and registrations of the convicted party, while a second offense will mean suspension for five years. An automobile owner arrested for drunkenness, even when not operating a car, may lose his license, as the new law requires that courts report all convictions for drunkenness of men who own or drive cars. The law also includes regulations for headlights and other provisions of a minor nature.

Near-Side Stop Adopted.—The Columbus (Ga.) Railroad has abandoned the far-side stop. The company believes that near-side stop operation involves less danger to the public at crossings.

Universal Transfers in Bellingham.—The Puget Sound Traction, Light & Power Company, Bellingham, Wash., has introduced the universal transfer system. The destination point is punched instead of the receiving line.

Seattle W. C. T. U. Opposes Smoking in Cars.—The City Council of Seattle has received a petition from the Federated Women's Christian Temperance Union, representing the eighteen local unions of the city, to prohibit smoking on all public conveyances.

Electric Heaters for Cars in Waco.—The City Commissioners of Waco, Tex., have ordered an ordinance to be drafted requiring the Texas Electric Railway, which owns and operates the street car lines in Waco, to heat its cars with electric heaters instead of oil stoves.

"Have You Forgotten Anything?"—The San Francisco-Oakland Terminal Railway, Oakland, Cal., has found it worth while to equip all of its cars with a small sign reading, "Have You Forgotten Anything?" The idea resulted from the large volume of business which the lost article department has been handling. A check will be made to see whether the sign effects any decrease in the articles left in cars and boats.

Holyoke Street Railway Seeks Increased Revenue.—L. D. Pellissier, president of the Holyoke (Mass.) Street Railway. has petitioned the Public Service Commission of Massachusetts to grant higher fares on the road or else to approve a rearrangement of fare zones in which passengers will be required to ride shorter distances than the present fares permit. A hearing will be held at the offices of the board in Boston on June 19.

Traffic Committee Appointed in New Orleans.—An investigation of transportation facilities in New Orleans, La., with a view to recommending remedies for street car congestion and to lay plans for improvement in the service is to be made by a committee named from members of civic and commercial bodies of the city. A representative of the city government and one for the New Orleans Railway & Light Company will be on the committee, which will report within a few weeks.

New Transfers Used at Syracuse.—The New York State Railways, Syracuse Lines, began on June 1 the use of a new style of transfer. Heretofore a different transfer was used for the morning and afternoon of each day of the month, which meant that sixty-two forms were necessary for each line. The new style is designed so that only one form need be carried in stock for each line. The station master will punch the month and the day of the month as before and the conductor will indicate the time of issue and the receiving line.

C., M. & St. P. Issues Descriptive Booklet.—A small illustrated booklet descriptive of the electrified divisions of the Chicago, Milwaukee & St. Paul Railroad has just been published. Much interesting information of a technical nature is contained therein, so presented as to be of value to the layman. The facts relative to the work of the powerful locomotives and comforts of the service on the two trains, "The Olympian" and "The Columbian," are among those given to show that this electrification marks "the dawn of the electrical era in railroading."

Information Booklet for Milwaukee.—A handy little booklet has been issued by The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., entitled "A Street Railway of Milwaukee." It gives the location of parks, public buildings, depots, hotels, theaters, principal industries and other information in regard to the city. A map of the city street carlines is attached, with a key to street numbers arranged to indicate the shortest way of reaching any part of the city. The booklet is being distributed through hotels, business associations and other agencies and will no doubt fill a long-felt want.

Serious Accident at Kenosha.—What probably would have been a fatal accident on the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., on May 15, was avoided when one of the cars was derailed by a towerman on the Kenosha & Rockford Division of the Chicago & Northwestern Railway to prevent a collision with one of the steam trains. The accident occurred at the crossing of the two tracks near Prairie Avenue, Kenosha, Wis. The car tipped over on its side as it plunged into the ditch, and several of the thirty-two passengers aboard, together with its crew, were injured.

H. & F. Fares Increase.—In accordance with the new tariff filed with the Maryland Public Service Commission by the Hagerstown & Frederick Railway, Frederick, as reported in the ELECTRIC RAILWAY JOURNAL recently, the change in rates of fare became effective on May 30. The changes do not affect the fares in the local city lines in Hagerstown and Frederick except for the discontinuance of ticket books, the use of which represented only about one-quarter of the total fares collected. On the interurban lines the cash fare will be increased from 5 cents to 6 cents per zone and ticket books containing eighteen coupons will be sold for $1. No increase was made in commuters' rates.

Boise Valley Wants One-Man Cars.—The Boise Valley Traction Company, Boise, Idaho, has asked permission of the Public Utilities Commission of that State to operate one-man cars, claiming that a saving of $8,800 can be effected annually. It is proposed to remodel for one-man car operation the cars now being used on the city lines. In the application that was filed the company asked the commission to set a date for a hearing when the city authorities and others interested in the proposed change could be heard. A bill was introduced in the lower house of the Idaho Legislature at the last session which forbade street railway companies to operate cars with less than two men. The measure was not passed.

Jitneys Barred From Busy Corner.—The Selectmen of Greenfield, Mass., have made the following traffic rule as a measure of relief from the congestion of automobiles and jitneys at the corner of Main and Federal Streets: "No owner or driver of a vehicle engaged in carrying passengers from whom fare is collected shall stop or stand on Main, Federal, Clay Hill or High Streets, except for the purpose of receiving or discharging passengers, and then only at such places as may be designated by the Board of Selectmen and for such time as may be sufficient to enable the passengers to get off or on such vehicle." The Selectmen will designate the places at which jitneys may receive or discharge passengers.

Companies Ask to Discontinue Tickets.—Two petitions for the discontinuance of ticket books on the street railways centering in New Bedford, Mass., have been filed with the Public Service Commission of that State. The first asks for the discontinuance of a twenty-ride book which is sold at $1 on the New Bedford & Onset Street Railway. It is said that passengers riding from New Bedford to Onset have taken unfair advantage of the use of these tickets to obviate the necessity of paying a cash fare in each zone. The second petition, made by the Union Street Railway, asks for authority to discontinue the fifty-ride monthly ticket books which are sold for $8 for use between New Bedford and Fall River. The cash fare between the two cities is 20 cents.

Ferry Service to Relieve Seattle Congestion.—The Seattle Port Commission is negotiating with the Puget Sound Traction, Light & Power Company for an exchange of transfers, to provide ferry service between the foot of Marion Street and Harbor Island and the west side of the west waterway. The proposition presented by the commission was for the traction company to receive 3 cents out of each 5 cents. No agreement has yet been reached. The object of the proposed ferry is to relieve the congestion in traffic on West Spokane Avenue, where 15,000 men employed in the shipyards and manufacturing plants on Harbor Island must be transported. The commission will make the same proposal to the City Council or to the public utilities department for transfer privileges with the city's Lake Burien line.

Play Safely with the New Man.—As a safety-first suggestion W. H. Parr, an employee of the Louisville (Ky.) Railway, recently submitted the following: "Remember the new man. So many employees are at work in our shop that every man must be careful in his work at all times. The carhouse foreman cannot do it all. The inspector cannot do it all. Careful work is the surest safeguard. Just be careful and remember the new man. You know the unsafe places and the unsafe ways, but he does not. Your first duty to the company is to prevent accidents. A few words of advice in time may save some one from a painful injury. Do your share. We are all paid to observe the rules. Is there any excuse for not obeying them? Carelessness is one crime where punishment is quick and sure. So it is up to you first, last and always."

Pacific Electric Lowers Fare.—Upon the request of the Railroad Commission of California, the city of Pasadena has dismissed its suit to require the Pacific Electric Railway to lower its fare from 10 cents to 5 cents for points along the East Orange Grove Avenue line between the old and new city limits of Pasadena. The company agreed to the change in its fares after it had received assurance from the commission that the act would not establish a precedent and force the acknowledgment that the addition of territory necessitates extending the 5-cent fare to that territory. It stated that lowering the rate in this case would make no appreciable difference in revenues because most of the people in the new territory had walked to the 5-cent fare limit and because there is little likelihood of an extension of the line on account of the nature of the territory served.

Automobile Traffic Puzzles Louisville.—Officials of the Automobile Club of Louisville, Ky., have become aroused by the failure of the city officials to enforce the traffic laws and are taking the initiative in the matter. An invitation to the club from the Board of Public Safety to assist in framing revised regulations has been received with interest and representatives of the club are resuming the study of traffic regulations. Except in the center of the city when the traffic police are on duty there is a general disregard for the provision that requires automobiles and other vehicles trailing street cars to stop when the cars stop to take on or let off passengers. Glaring headlights are used without molestation. Cars are parked freely on the forbidden side of the streets, while slowly-moving vehicles disregard the provision requiring them to hug the curb and invariably ride the rails.

Consolidated Will Not Ask Increase.—The Worcester (Mass.) Consolidated Street Railway, according to a statement given out by General Manager Page, will not ask the Public Service Commission for authority to increase its fare to 6 cents in accordance with the general movement for more revenue. He said that in Springfield, where it has been decided to ask for the 1-cent increase, the transportation conditions are quite different. Mr. Page expressed the attitude of the company as follows: "I have confidence that we have seen the worst of the high cost of living and of materials. The investigation of conditions being conducted by the federal government will, I expect and hope, bring relief from the burden to the public. The Consolidated officials are sitting tight on the lid, keeping down expenses as much as possible, and hope to be able to continue giving the public satisfactory service until the turn for the better comes in business conditions and we can go into the market for improved equipment."

Street Cars Versus Autos.—The following letter was received by the Pine Bluff (Ark.) Company from an auto driver who adores trafficless autoing, so says *Public Service*, that company's publication: "Gents: It occurs to me 'and while I'm talking my opinions good' that to facilitate the proper kind of auto traffic you should use an advance guard in the operation of your street cars, the duties of this man should be to walk along, say 50 ft. ahead of each street car, and as autos approach the car track for this guard to signal the motorman to stop—you might install a wireless set on each guard and car so these signals can be transmitted quickly in order not to delay auto traffic. I'm working on a patent 'hurdler' for street cars so they can hurdle autos as an important time saver. As each street car carries, say ten to twenty passengers, and each automobile the large number of 'one' to 'five' you can readily see auto traffic must not be interfered with by street cars."

Accidents on Increase in New York.—Forty persons were killed in New York City by motor vehicles during the month of May as compared with twenty-seven for the corresponding month in 1916, according to the monthly traffic accident report of the National Highways Protective Association. The total number of deaths from traffic accidents was forty-seven, three of which were caused by trolleys and four by wagons as against four by trolleys and ten by wagons in May, 1916. In the State outside of New York City twenty-six persons were killed by automobiles, two by trolleys and one by wagon. Of those killed in the city twenty-five were children and in the State eight. Eight were killed at highway railroad grade crossings in the State during the past month. Regarding the increase in the number of deaths by automobile accidents, Colonel Edward S. Cornell, secretary of the association, said: "There is only one way to put a check on this slaughter, and that is by a law requiring all who drive automobiles to have a license, based on qualification, instead of limiting this requirement to chauffeurs, as is done at present."

Commission Discusses Grade Crossing Order.—A hearing was held on June 6 by the Public Service Commission of New York, First District, to consider the proposal of the commission to order railroad crossing gates on the lines within its jurisdiction to be kept closed constantly between midnight and 5 a. m. Reports were received covering inspections of the operation of crossing gates which were conducted by the commission. The problem seems to lie in the failure of gatemen to keep awake at night to attend to duty properly. Keeping the gates normally down except when raised to permit the passage of vehicles would be virtually prohibitive on highways having a heavy vehicular traffic. Among alternative measures recommended were the use of a clock-punching system, irregular inspections of the men on duty supplemented by discipline, and the use of semaphores interlocked with the gates to give a stop indication when the gates are up. The commission will co-operate with the police department in making a more thorough study of the crossings to determine how generally it would be practicable to operate the gates normally down as proposed.

Rerouting Complaint Dismissed.—The Public Service Commission of Pennsylvania has announced that it has dismissed the complaint of the Central Germantown Avenue Business Association against the Philadelphia Rapid Transit Company relative to the rerouting of cars operating on routes known as 23 and 55. The complaint was directed particularly against the rerouting so that the cars do not now, as formerly, pass along portions of Germantown Avenue between Glenwood and York Streets. Commissioner Ryan dissented, it was said, when the decision of the other members was made known, but his reasons are not given. The contentions of the complainants were based on the fact that the cars on routes 23 and 55 in going northward did not pass their places of business and that on account of this fact business had been diverted elsewhere. It was also claimed that the rerouting was illegal in that the charters fix the routes. The commission holds that it cannot be said that the increasing or decreasing facilities on certain streets as long as service is maintained is in violation of the charter obligations of the respondent company and its underlying concerns.

Personal Mention

Phillip Matter has been elected a vice-president of the Union Traction Company of Indiana, Anderson, Ind.

Elihu S. Rowley, heretofore day dispatcher at the Light Street carhouse of the United Railways & Electric Company, Baltimore, Md., has been promoted to the position of instructor of conductors.

A. J. Davis has been engaged by the Kansas City (Mo.) Railways to manage a new express department. The company expects to be prepared to give express service on its lines in the near future.

F. D. Burpee, superintendent of the Ottawa (Ont.) Electric Railway, has obtained leave of absence for military service. He is now a major in the 207th Battalion, which was recruited in Ottawa and is now overseas.

H. W. Huston, general foreman of the Elyria shops of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, has resigned to take a similar position in the Erie shops of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y.

Paul A. Zinsheimer, head of the stock and bond department of the Railroad Commission of California for five years, has resigned to accept a position with the Union Trust Company, San Francisco, Cal., as assistant to I. W. Hellman, the president.

Allen G. Hoyt of the National City Company, New York, N. Y., which is affiliated with the National City Bank of that city, has been elected a vice-president and a director of the Washington Railway & Electric Company, Washington, D. C. Mr. Hoyt was formerly president of the American Public Service Company, New York, before that company was acquired by the Insull interests of Chicago.

H. E. Brandli, the new general manager of the Meridian Light & Railway Company, Meridian, Miss., has led a movement among the employees of that company to form a mutual get-together club. At the organization meeting held recently a committee was named to draft a set of by-laws and a constitution. The motto selected for the organization is "Public Service—the Best That Can Be Given."

Darwin R. Cafferty, instructor of motormen for the elevated lines of the Interborough Rapid Transit Company, New York, N. Y., has received an indefinite leave of absence on account of ill health. Mr. Cafferty began his service with the company forty years ago as a locomotive operator on the Third Avenue "L." Before his departure he was the guest at a banquet attended by fifty-six of his fellow workers.

Melvin H. Fowler, line foreman of the Bay State Street Railway, Boston, Mass., stationed at Chelsea, has the distinction of being the first man enlisted as an officer in the federal merchant marine service. Mr. Fowler was appointed after a large number of applications had been rejected by the United States Shipping Board. Until he is assigned to duty he will attend training school at Harvard University under government officers.

N. B. Rhoads, superintendent of the electric and railway departments of the Jackson Light & Traction Company, Jackson, Miss., has been ordered to report at New Orleans for service in the navy as assistant paymaster. He will rank as lieutenant, junior grade. Mr. Rhoads was in naval service for three years and has since been on the reserve list. Will Brown, manager of the gas department, will assume charge of Mr. Rhoads' departments.

C. C. Collins accepted a position recently as traffic manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio. Mr. Collins' career as a railway man was begun in 1890 and has been largely concerned with traffic problems. In that year he became chief clerk in the traffic department of the Columbus & Eastern Railroad. This road was later merged with the Columbus, Sandusky & Hocking Railway upon its completion and Mr. Collins was made division freight agent at Toledo. When the road was sold to the Pennsylvania lines in 1898, Mr. Collins engaged in business in Porto Rico. Upon his return to Ohio and following a short connection with the Detroit, Toledo & Ironton Railroad he was appointed general express and passenger agent of the Columbus, London & Springfield Railway, Springfield, Ohio, the position he held until 1907. At that time he entered the service of the Western Ohio Railroad, Lima, Ohio, and a year later was made traffic manager of the system. He resigned this position in 1911 to take a similar one with the Lehigh Valley Transit Company, Allentown, Pa. Mr. Collins was one of the organizers of the Central Electric Railway Association and has displayed an active interest in its affairs.

J. P. W. Brown, superintendent of the lighting and power departments of the Nashville Railway & Light Company, Nashville, Tenn., has been advanced to the position of assistant general superintendent, a position newly created by the company. Mr. Brown started his career with the Cumberland Electric Light & Power Company about twenty years ago. When this company was absorbed by the Nashville Railway & Light Company, two years later, he was made superintendent of light and power. While the departments have been under his direction the number of customers served has increased from 300 to 16,000. These years of successful service with the company have paved the way for his recent well-deserved promotion. Mr. Brown is a native of Nashville and a graduate of the engineering department of Vanderbilt University. He has for many years been prominently identified with civic affairs of his community and is a member of the Commercial and Hermitage clubs and other local organizations.

J. P. W. BROWN

Obituary

Augustus Wolff, superintendent of motive power of the United Railways & Electric Company, Baltimore, Md., died on May 17 at his summer home at Kensington Road, Ten Hills. His death was due to a stroke of paralysis which he suffered about three weeks previously. Mr. Wolff began his railway career as a helper to the engineers on the old Brooklyn, Bath & West End Railroad. He later became master mechanic for the Atlantic Avenue Railroad, and when these lines were merged into the Brooklyn (N. Y.) Rapid Transit Company became chief construction engineer. In 1903 he went to San Francisco, Cal., to accept a position as superintendent of motive power for the United Railroads of that city. Mr. Wolff went to Baltimore to act in a similar capacity for the United Railways & Electric Company in 1908, after having renewed his connection with the Brooklyn Rapid Transit Company for a short period. He has been the head of the United Railways & Electric Company motive power department continuously since that time and was regarded as one of the most valuable and loyal members of the organization.

The car men's safety committee of the San Diego Electric Railway, San Diego, Cal., recently issued a statement enumerating the benefits of the mutual safety plan used by that company to reduce to a minimum street car accidents. The safety-first movement was inaugurated by William Clayton, vice-president and managing director of the company, and judging from the salient features of his plan, it is obviously far-reaching in its effect. Three per cent of the gross earnings of the company, which was the amount formerly used to cover all accident claims, is turned over to the car men. Out of this amount the men pay all accident claims and the balance left at the end of the year is divided among them. This naturally makes the men more careful to avoid accidents, which tends to safeguard the company's property and insure greater comfort and safety to the public.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Henryetta-Dewar-Kusa Traction Company, Henryetta, Okla.**—Incorporated to construct and operate an electric railway between Henryetta, Dewar and Kusa. Capital stock, $350,000. Incorporators: Barclay Morgan, G. W. Burnett, J. J. Harrison, H. R. Christopher, L. E. Drummond of Dewar, and Morton Henderson, Kusa.

FRANCHISES

Rialto, Cal.—The Railroad Commission of California has authorized the Pacific Electric Railway to construct spur tracks and sidings at grade between Riverside and Date Streets, Rialto.

New Orleans, La.—An ordinance has been introduced into the Council to amend the franchise of the Orleans-Kenner Electric Railway so as to permit freight to be hauled over the road in Jefferson Parish. The purpose is said to be to permit the line to haul material for reconstruction and repairs to its road.

Gardner, Mass.—The Northern Massachusetts Street Railway has asked the Board of Selectmen of Gardner for permission to relocate its track on Lake Street to conform with the grade and alteration of the street.

Woburn, Mass.—The Bay State Street Railway has received a franchise from the City Council of Woburn for the reconstruction and extension of its double track on Main Street.

Passaic, N. J.—The Public Service Railway has asked the Board of Commissioners for permission to construct an extension of its line through East Main Avenue from Park Place to Central Avenue.

South Amboy, N. J.—The Jersey Central Traction Company has received a franchise from the City Council to construct and operate an electric railway in South Amboy.

Brooklyn, N. Y.—The Brooklyn Rapid Transit Company has applied to the Board of Estimate for a franchise to construct a line on Van Wyck Avenue, the dividing line between Richmond Hill and Jamaica, from Fulton Street south to Rockaway Boulevard.

Ithaca, N. Y.—The Ithaca Traction Company has asked the Public Service Commission for the Second District of New York for its approval of franchises recently granted by the Common Council to that company and the Central New York Southern Railroad for extensions in Ithaca.

Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has refused the proposition of the City Council relative to an ordinance giving the company a franchise in Poland Avenue and East Woodland Avenue to connect with the present Poland Avenue line via the South Avenue viaduct. The company states that, owing to present conditions resulting from the war, it will be unable to make any extensions not already authorized.

Portland, Ore.—The Portland Railway, Light & Power Company has received a twenty-five-year franchise from the County Commissioners to construct and operate a transmission line along the Columbia Highway.

Woonsocket, R. I.—The Rhode Island Company has received a franchise from the City Council to construct tracks on Page Street between Clinton and Social Streets.

Pleasant Valley, W. Va.—The West Virginia Traction & Electric Company of Morgantown has applied to the Town Council of Pleasant Valley to construct and operate an electric lighting system for a period of fifty years. The company has also applied for a fifty-year franchise to construct and operate a waterworks system in the town of Edgewood.

TRACK AND ROADWAY

Pacific Electric Railway, Los Angeles, Cal.—It is reported that an extension of the Victoria Avenue line may be built in Riverside to the Arlington Heights district.

San Francisco, Napa & Calistoga Electric Railway, Napa, Cal.—It is reported that this company will change its present line near Suscol. The change will eliminate a sharp curve ½ mile southeast of Suscol. Grading has been done and rails will be laid shortly.

Wilmington, Del.—Surveys of the proposed electric railway from Wilmington to Dover have been begun by Emory & Eisenbrey of Philadelphia. DeArmond Lindes, Philadelphia, is interested. [May 26, '17.]

Chicago (Ill.) City Railway.—It is reported that the Chicago City Railway will soon extend the Devon Avenue line from Western Avenue to Kedzie Avenue.

Kankakee & Urbana Traction Company, Urbana, Ill.—An extension about 1 mile long will be built by the Kankakee & Urbana Traction Company across one side of the new aviation field which the government has located adjacent to the company's right-of-way near Rantoul.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—Work will soon be begun by this company removing its bridge over the canal feeder at the Centlivre brewery. The north track will be taken out and a temporary passageway made until the work of removing the bridge has been finished. Several cars of cinders have been dumped into the old canal bed and as soon as it has settled sufficiently the city will pave it. This action will eliminate a dangerous bridge.

Kansas City-Western Railway, Kansas City, Kan.—The Kansas City-Western Railway has begun the work of improving its lines in Leavenworth.

St. Louis-Kansas City Electric Railway, Kansas City, Mo.—A bill in equity asking that a receiver be appointed for the St. Louis-Kansas City Electric Railway has been filed in the Circuit Court by H. B. Cochrane and Ira G. Hedrick, engineers. The company was organized in 1909 with a capital stock of $15,000,000 and only 1 mile of double track near Independence has been built.

Great Falls (Mont.) Street Railway.—The Montana Power Company, operating the Great Falls Street Railway, in a communication addressed to the City Commissioners, has gone on record as being unwilling to expend a large amount of money in the construction of a bridge at First Avenue North unless the city is also willing to build a similar structure at Fifteenth Street. The present bridge at Fifteenth Street will have to be replaced and the First Avenue North bridge is entirely inadequate for traffic. Should the city build only the First Avenue North bridge, the company would be compelled, in the near future, to build a private structure at Fifteenth Street to provide service for the north and west sides. The company estimates that the bridges could be constructed for about $200,000 each. The company would be willing to participate in their construction to the extent of $50,000 providing the city will construct both bridges and grant the railway rights over both for a reasonable term of years. The company is willing to extend its lines to the west side, although they would have to be operated at a loss for some time, but only on the conditions set forth.

Atlantic Coast Electric Railway, Asbury Park, N. J.—This company will reconstruct its tracks on F Street, Belmar, to conform to the new grade.

Salem & Pennsgrove Traction Company, Salem, N. J.—Plans are being made by the Salem & Pennsgrove Traction Company for the erection of a drawbridge at Salem.

Interborough Rapid Transit Company, New York, N. Y.—A portion of the new Jerome Avenue line of the Interborough Rapid Transit Company extending from 149th Street and Mott Avenue north to Kingsbridge Road and Jerome Avenue was placed in operation on June 2. Operation has also been begun on a portion of the Seventh Avenue subway from Thirty-fourth Street to Forty-second Street, where transfer can be made to the old subway. The new line also provides a rapid transit route by transfer between the Grand Central and the Pennsylvania Railroad stations.

Shelby Northern Railway, Shelby, N. C.—This company has awarded a contract to the Cleveland Construction Company of Shelby for the construction of its line from Shelby to Casar, via Fallston, 22 miles. Three frame trestles, total length 700 ft., will be erected in connection with the line. J. A. Vandegrift, Shelby, general manager. [Dec. 19, '14.]

Scioto Valley Traction Company, Columbus, Ohio.—Arrangements are being made by the Scioto Valley Traction Company to rebuild the light and power distributing system in Kingston. Material for the work, it is understood, has been purchased.

Mansfield Public Service & Utility Company, Mansfield, Ohio.—It is reported that improvements will probably be made on this company's lines in the near future.

Brantford (Ont.) Municipal Railway.—A committee has been appointed by the City Council of Brantford to interview the commission in charge of the Brantford Municipal Railway in connection with the proposed extension of the line into the Terrace Hill district.

Port Arthur (Ont.) Civic Railway.—An order has been placed by the Port Arthur Civic Railway for 250 pairs of continuous rail joints for 80-lb. A. S. C. E. section, to replace the present straight angle bars on its line on Main Street from Arthur Street to Bay Street.

Toronto (Ont.) Railway.—The Board of Control recently adopted the report of Commissioner Harris recommending the city to pay $10,000 toward the new car line to be built at Ashbridge's Bay, east of Cherry Street. The new line is for the benefit of the employees of the Imperial Munitions Board in the new plant which is being erected at Ashbridge's Bay. The total cost of the line will be $185,000, the bulk of which will be borne by the railway company and the Harbor Board. It is expected that the road will be ready for operation by July 15.

Southern Pennsylvania Traction Company, Chester, Pa.—Work has been begun by the Brubaker Paving Company, Huntington, W. Va., on the reconstruction of the tracks of the Southern Pennsylvania Traction Company from Saville Avenue, Chester, to Darby.

Conestoga Traction Company, Lancaster, Pa.—Plans are being made for extensions and improvements to this company's property at Lancaster.

Montreal (Que.) Tramways.—It is reported that the Mayor has approved the construction of a line to the top of Mount Royal. Plans will be prepared by the city engineer.

Dallas Northwestern Traction Company, Dallas, Tex.—Grading will be begun at once by the Standard Utilities Construction Company on this company's proposed line from Dallas to Slidell, via Denton. The right-of-way has been surveyed from Dallas to Slidell. [May 12, '17.]

SHOPS AND BUILDINGS

City Light & Traction Company, Sedalia, Mo.—This company has completed a 1200-ton storage plant in connection with its ice-making plant.

Piedmont & Northern Railway, Charlotte, N. C.—A contract has been awarded by the Piedmont & Northern Railway to the Fiske-Carter Construction Company, Greenville, for repairing its freight station at Greenville, recently damaged by fire.

Northwestern Pennsylvania Railway, Meadville, Pa.—The carhouse of the Northwestern Pennsylvania Railway at Meadville, containing fifteen cars, was recently destroyed by fire. The loss is estimated at $80,000.

POWER HOUSES AND SUBSTATIONS

Fort Wayne & Decatur Traction Company, Decatur, Ind.—Plans have been prepared by the Fort Wayne & Decatur Traction Company for the erection of a substation, 23 ft. x 60 ft., in Decatur.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—This company plans to make additions to its power plant, doubling its capacity.

Eastern Texas Electric Company, Beaumont, Tex.—An addition is being built to the Port Arthur power station by the Eastern Texas Electric Company. A new 4000-kw. turbo-generator will be installed.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Reducing the Selling Cost

Accessory Manufacturer Seldom Comes in Contact with Purchasing Agent—Mechanical Department Should Keep Manufacturers' Literature

BY L. W. HORNE

General Manager Horne Manufacturing Company, Brooklyn, N. Y.

With reference to an article which was published in the April 14 issue, page 720, giving my views on selling costs, I have noted with interest the comments pertaining to this subject by W. V. C. Buckeley, purchasing agent of the Columbus Railway, Power & Light Company, and E. C. Johnston, purchasing agent of the East St. Louis & Suburban Railway.

It is evident from the articles of the two officials above mentioned, which appeared in the issues of May 5 and May 12 respectively, that purchasing agents in general are paying more attention to the art of purchasing than officials of the mechanical department. This is only natural, as they make a specialty of this phase of the railway company's business. The writer and other representatives of this company seldom come in contact with the purchasing agents, and it was therefore my primary intention to direct my original remarks to the officials in charge of the mechanical department.

The majority of the devices manufactured by this company are specialties, generally purchased in conjunction with new cars. It is in connection with specifications on new cars that we find our selling expense to be high, and it is difficult to say whether any real remedy will ever be found. For instance, a road is reported to be ready to purchase new equipment. We try not to bother the company until details of car bodies, trucks, motors and air brakes, which constitute the vital items, have been decided upon. We then call their attention to our specialties. This subject is handled by the master mechanic if the road is a large one, or by the general manager if the road is small. Frequently, after the specifications are decided upon the purchase of the cars is postponed for many months, and in some cases more than a year. When the railway company is ready to place the order for cars it is necessary for the manufacturer to go over the entire subject again with the railway official in charge. After the car builder has been selected the supply house must then concentrate a third effort on the car builder in order to obtain the order for the material specified as quickly as possible, as competitors will naturally continue to work with the railway company in order to get the specifications changed, during the period that the car builders are making ready to construct the cars.

In regard to renewals or repair parts for our specialties, we find that our bulletins are often mislaid in the master mechanic's office, because this official frequently has not proper facilities for filing. As all of these special parts are specified by the mechanical department, the purchasing agents must rely upon that department for information as to the manufacturer, part numbers, etc. There is a device that we manufacture which has been on the market for the past eighteen years. A certain company desired repair parts for this device but was unable to locate the manufacturer. It then made up pattern equipment at a cost of $50, and made a few castings from the pattern in order to keep its cars in service. These parts could have been purchased from us for $3 each.

It is possible that I have been too frank in discussing this subject, but I am trying to obtain better recognition for the manufacturer of railway specialties, and am urging that more attention be paid to catalogs and other printed matter sent for the information of officials of the mechanical department.

Not All the Fault Lies with the Manufacturer

Railroads Should Be Accurate and Specific When Placing Orders—Packing and Shipping Instructions Important

Charles Christopher, storekeeper of the San Francisco-Oakland Terminal Railways, is not inclined to place all of the blame for misunderstood orders, misrouted shipments and delayed deliveries upon the shoulders of the manufacturer. The adage that "The customer is always right" really is unjust, he says, in many instances.

Despite the long distance to Oakland from most of its supply companies and despite a badly unsettled market, Mr. Christopher has few complaints to make about service or deliveries. Of 15,000 items kept in stock, he was short only eighty-six when interviewed on April 30. Even these items were not needed for thirty or sixty days, as they had been put down on the "short" list when the requisition for the last pieces in stock had been filled. So satisfactory a condition could be due only to a most careful watch of demands upon the stockroom.

Mr. Christopher said that if railways wanted prompt service they should make it a point to order things by the manufacturers' catalog numbers and use the manufacturers' names for the articles desired. Further, they should give precise packing, rating and routing instructions. For example, if castings are ordered sent in barrels or boxes, the rate will be less than if they are sent wired together; and, again, the weight of the shipment often is a deciding factor as to whether freight or express transportation should be chosen. It is unfair to the manufacturer to order blindly and then hold him at fault for errors. The fundamental trouble is that many railways look upon the storekeeper and his assistants as mere counters, weighers and checkers. A good stock man can save his company thousands of dollars annually because of his specialized knowledge of markets and transportation, and this entitles him to a position above that of a simple clerkship.

Incidentally, it may be added that a surprise visit to the storerooms of the San Francisco-Oakland Terminal Railway revealed one of the best-kept plants in the country. Even such minor parts as bolts and nuts are neatly stacked instead of being thrown into the bins. A framed typewritten card over each compartment gives an entirely adequate description of the contents.

Don't Set Your Own Standards

Middle Western Purchasing Agent Questions Big Companies Suggesting Their Own Particular Size of a Catalog as a Standard

BY S. S. DUNBAR

Purchasing Agent Union Traction Company of Indiana, Anderson, Ind.

The article by Mr. Rice of the General Electric Company, appearing in the issue of April 28, page 808, and the facts given in the issue of May 5, page 854, from various companies regarding the so-called standard sizes of catalogs, are illuminating, if anything can be illuminating which indicates such dark prospects in the way of the adoption of standard sizes of catalogs. Mr. Rice takes the very general attitude of many individuals in practically stating that the General Electric Company is in favor of a standard size of catalog, provided its standard size is adopted; and the same idea is voiced in the extracts from the expressions quoted from other advertising managers for large companies. It might be suggested that the Technical Publicity Association line up some of the larger members.

Mr. Rice indicates that the paper manufacturers should make sizes satisfactory to the standards of the buyer, but it is desirable that smaller manufacturers use standard sizes as well as the big fellows, and the small manufacturer certainly cannot order printing in large enough quantities to have the paper made to order. The 8½-in. x 11-in. catalog page will cut from an existing standard size adopted by the paper mills. The great majority of people use this size, and it is convenient and of good appearnce. If the size is reduced ½ in. each way, *i.e.*, to 8 in. x 10½ in., and the same margin is retained (and often a large margin is used with the smaller size sheet), there is less writing space on the smaller sheet by a great deal more than the 10 per cent which Mr. Rice points out as being saved in using the 8-in. x 10½-in. size in place of the 8½-in. x 11-in. size.

It has not been the idea of the writer to argue for the 8½-in. x 11-in. size particularly, but if every man says a standard is all right so long as you adopt "mine," we shall not get any standard. It is hoped that this matter will be kept alive until some results are obtained.

Westinghouse Gross and Net Increase

Completion of Munition Orders Contributed Largely to Result, but Sales Billed and Net Income for Regular Products Showed Big Increases

The income statement of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., for the year ended March 31, 1917, follows:

Gross earnings sales billed	$89,539,442
Cost of sales	72,077,751
Net manufacturing profit	$17,461,690
Other income	1,386,546
Gross income from all sources	$18,848,237
Deductions from income	768,348
Net income available for dividends and other purposes	$18,079,888

The gross earnings and net income for the year were greatly in excess of any previous year in the history of the company. The completion of large orders for munitions contributed largely to the results for the year, although sales billed and net income for the regular products showed large increases over any preceding year. The amount of taxes—federal, state and county—paid or accrued during the year was in excess of $2,000,000. The value of unfilled orders on March 31, 1917, for the regular products was $39,776,739, as compared with $22,097,995 on the same date of last year.

The net income for the year was $18,079,888.83, thereby increasing the surplus of $9,246,707.03 as of March 31, 1916, to a gross surplus of $27,326,595.86. Dividends were declared for the full year at the rate of 7 per cent per annum upon the preferred stock and upon the common stock at the rate of 6 per cent for the first and second quarters and at the rate of 7 per cent for the third and fourth quarters. For the purpose of increasing the reserve account, the sum of $5,000,000 was appropriated from surplus. The net surplus as of March 31, 1917, was $18,105,298 as compared with $9,246,707 on March 31, 1916.

The property and plant account showed a net increase during the year of $1,499,805. Depreciation of buildings and equipment and expenditures for extensions, renewals and betterments of plant and equipment was written off during the year to the amount of $6,473,066. Investments in other companies increased during the year $2,493,825, which chiefly represents additional shares of the Electric Properties Corporation and Canadian Westinghouse Company acquired during the year.

By the sale in February, 1917, of $15,000,000 additional common capital stock and the conversion of over $3,000,000 of bonds, the total outstanding capital stock was increased during the year to $74,812,650. The balance, $2,247,000 of the convertible sinking fund 5 per cent gold bonds issued in 1915, outstanding on Oct. 1, 1916, were called for redemption on Jan. 1, 1917. All but $71,000 face value of these bonds were converted into common stock, par for par, before the redemption date.

The annual report states that with the exception of the contracts with the British Government for the manufacture of Russian military rifles which are being carried out by the New England Westinghouse Company under a modified contract, the company has no uncompleted munitions contracts for foreign governments on its books, all such contracts having been completed or canceled.

Handling Sales in the Orient

American Salesman After Long Trip Recommends Foreign Sales Be Handled Through Export Houses

James G. Drought, Chicago sales manager of the U. S. Graphite Company, has just returned from an eight months' trip through the Orient, where he visited Japan, China, the Philippines, Russia and Hawaii for the purpose of promoting the sale of his company's motor and generator brushes. When interviewed as to suggestions which might be of interest to other manufacturers who received inquiries from traction properties in the far East, Mr. Drought made the definite statement that the best mehod of handling individual sales would be through some of the large special organizations which make a business of importing supplies for the Oriental trade. There are large distributors, some with offices in New York, who are well equipped with staffs of engineers and salesmen in the far East. The problem for the American manufacturer, particularly the one with a limited foreign trade, is greatly simplified after he has made working relations with one of these well-established organizations. Most of these organizations have branches or correspondents in New York, and the American manufacturer can lay the goods down in New York and receive his money without the work, worry and risk of making foreign deliveries.

Effect of War on Carbolineum Business

American Manufacturers of Carbolineum Grades of Wood Preservers Fulfill Trade Requirements

By E. E. Pershall

General Superintendent Kettle River Company, Minneapolis, Minn.

One of the largest benefits gained by American industry from the world war is the enforced development of the manufacture of certain commodities heretofore not produced in a large way in this country. Carbolineum grades of wood-preserver oil offer a notable example. Until three years ago the manufacture of these oils for wood preservation was confined largely to Germany, and German oils dominated the American market. However, the cessation of German exportation with the beginning of the English blockade gave the American users prospects of a German carbolineum oil famine. But the American manufacturers, recognizing the opportunity which the situation afforded, immediately commenced the production of the carbolineum grades of creosote oil, and to-day the American oils fulfill the requirements of the trade both as to quality and quantity.

One of the reasons why the German oil was so well established in America was its alleged secret process of manufacture. The oil was said to include chemicals compounded by secret processes known only to the Germans. Americans then engaged in the wood-preserving business found it more profitable to act as local representatives for German agents than to attempt to compete.

Exposing the German Claims

The German claims were known to our chemists to be part of clever sales schemes. The United States government tests had proved the perfect wood preserver to be the high boiling creosote oil distilling above 300 deg. C., providing that the oil was a pure coal-tar distillate. There was nothing mysterious or unusual about either the formula or the coal. Experts knew that America had the proper coal.

The foreign-trade conditions in 1914 gave us a chance to find a market for American oil. All shipment of German carbolineum wood-preserving oil to this country had been stopped. This was our opportunity, and we at once erected stills and other machinery used in the production of the German carbolineum grade of wood-preserving oil. Since 1914 carbolineum grades of oil have been manufactured which pass the specifications prescribed by the United States Signal Service and the United States Navy.

THE AMERICAN OIL

We have had no trouble in finding a market, and if we had not been able to manufacture this oil the American trade would have found itself facing a wood-preserver famine. Instead of embarrassment because of a lack of oils fair deliveries for three years have been given by a well-organized sales department. Our trade-marked oil is known as "K-R-Wood Preserver." I do not think that German oils will ever again be able to compete seriously in the American market.

British Westinghouse to Be Controlled in England

By resolution of stockholders the control of the British Westinghouse Electric & Manufacturing Company is to pass from America to a group of capitalists in Birmingham, England. This change is made as the result of the policy of British industry to become independent of foreign capital control. The American interests, it is said, have no desire to part with their holdings, but they appreciate the reasons for the change. They will retain a minority interest in the British company.

The control will pass under an option given last December. Since under British law a company cannot buy its own shares, a holding company is being formed to buy the shares and debenture stock held in America, the price to be paid being approximately £1,250,000 in first lien 5 per cent bonds and £100,000 in ordinary shares for an original investment said to be £1,820,000. The ordinary-share provision gives the American interests half the profits of the holding company beyond 6 per cent. The return to them under the new plan, it is reported, will be the same as at present. Through purchase of securities of the British company by the new holding company, about £750,000 of new capital is to be secured by the former.

NEW YORK METAL MARKET PRICES

	May 3	June 9
Prime Lake, cents per lb.	31	32½
Electrolytic, cents per lb.	31	32½
Copper wire base, cents per lb.	36	36
Lead, cents per lb.	9⅞	11½
Nickel, cents per lb.	50	50
Spelter, cents per lb.	9½	9¾
Tin, Straits, cents per lb.	58½	60¼
Aluminum, 98 to 99 per cent, cents per lb.	60	63

OLD METAL PRICES

	May 3	June 9
Heavy copper, cents per lb.	24½	28
Light copper, cents per lb.	21½	25½
Red brass, cents per lb.	18½	19½
Yellow brass, cents per lb.	17½	18
Lead, heavy, cents per lb.	7¾	8¾
Zinc, cents per lb.	7	7
Steel car axles, Chicago, per net ton	$41.50	$42.50
Iron car wheels, Chicago, per gross ton	$24.00	$34.00
Steel rail (scrap), Chicago, per gross ton	$31.50	$37.50
Steel rail (relaying), Chicago, per gross ton	$39.00	$42.50
Machine shop turnings, Chicago, per net ton	$11.00	$15.50

CURRENT PRICES FOR MATERIALS

	May 3	June 9
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40.00	$40.00
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38.00	$38.00
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.85	$4.00
Steel bars, Pittsburgh, per 100 lb.	$4.00	$4.25
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$6.90
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$8.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl.	$2.12	$2.40
Cement (carload lots), Chicago, per bbl.	$2.16	$2.31
Cement (carload lots), Seattle, per bbl.	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.22
White lead (100 lb. keg), New York, cents per lb.	10¾	11¾
Turpentine (bbl. lots), New York, cents per gal.	52	44

ROLLING STOCK

Wisconsin Electric Railway, Oshkosh, Wis., is reported to be in the market for ten city cars.

Union Street Railway, New Bedford, Mass., is reported to be in the market for six cars.

Gary & Interurban Railroad, Gary, Ind., through Ford, Bacon & Davis, has purchased two motor and four trail cars from the McGuire-Cummings Company.

Terre Haute (Ind.) Electric Traction Company on May 21 had one car completely destroyed by a fire which started in its local carhouse.

Cincinnati (Ohio) Traction Company is reported to have placed an order with the Cincinnati Car Company for 100 cars.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, is reported to have purchased four cars from the Cincinnati Car Company.

Trenton & Mercer County Traction Company, Trenton, N. J., has received permission from the Public Utility Commission to sell twenty old summer cars.

Nipissing Central Railroad, North Cobalt (Ont.), Canada, has purchased three second-hand cars from the East St. Louis, Columbia & Waterloo Railway, East St. Louis, Ill. These are 50-ft. interurban cars and will be used until new equipment can be ordered and built.

Saskatoon Municipal Railway, Saskatchewan, Canada, is in the market for three single-truck double-end cars. The cars desired are 33 ft. long over all with a seating capacity of thirty-two passengers. The equipment per car wanted includes two 40-hp. motors, controllers, hand brakes, center aisle reversible cane seats, forced-draft heaters, etc. The weight of each car should not exceed 35,000 lb.

Worcester (Mass.) Consolidated Street Railway, noted in the May 5 issue as being in the market for a number of cars, has specified the following details on seven box express cars:

Number of cars ordered	4 Motor, 3 Trailer
Date order was placed	May 19, 1917
Date of delivery	Nov. 15, 1917
Builder	Osgood-Bradley
Type	Box express
Weight (total)	28 tons
Bolster centers, length	26 ft. 6 in.
Length over bumpers	45 ft. 0 in.
Length express compartment	35 ft. 8½ in.
Width over all	8 ft. 4⅞ in.
Rail to trolley base	11 ft. 7¾ in.
Body	Semi-steel
Interior trim	Sheathed inside
Roof	Arch
Air brakes	G.E. straight and automatic
Axles	Forged Steel
Bumpers	Rico anti-climbers
Control, type	K-35-G-2
Designation signs	Ill., "Freight"
Couplers	Tomlinson MCB
Fenders or wheelguards	Pfingst
Gears and pinions	Forged steel, heat-treated
Hand brakes	Horne double acting (Motor) Blackall vertical staff, (Trailer)
Heaters	Electric
Headlights	Crouse-Hinds "Melobeam"
Journal boxes	Symington
Lightning arresters	Westinghouse
Motors	Four West. No. 306-CV, inside hung
Enamel	Sipes' Enameloil
Sanders	Murphy
Retrievers	Wilson No. 2
Trolley base	U. S. No. 13
Trolley wheels	Railway standard
Trucks	Wason, arch-bar
Ventilators	None
Wheels	33-in. cast iron

Northern Ohio Traction & Light Company, Canton, Ohio, which is having twenty-five vestibuled pay-within cars built for it by the St. Louis Car Company, has specified the following details:

Number	25
Builder	St. Louis Car
Type	Vestibuled pay-within
Seating capacity	40
Weight (total)	36,840 lb.
Truck centers, length	19 ft. 0 in.
Length over bumpers	41 ft. 4 in.
Length over vestibule	40 ft. 4 in.
Width over posts	8 ft. 2 in.
Height, floor to ceiling	7 ft. 6 in.
Height, sill to trolley base	8 ft. 5¼ in.
Body	Steel sides with wooden superstructure
Interior trim	Honduras mahogany
Headlining	3/16-in. Agasote
Roof	Turtle-deck
Underframe	Steel
Air brakes	Westinghouse
Axles	St. Louis Car
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Cables	St. Louis Car
Conduits	St. Louis Car
Control, type	GE. K-35
Couplers	St. Louis Car, Hovey type
Curtain fixtures	Forsyth No. 88
Curtain material	Pantasote No. 77
Designation signs	Illuminated, St. Louis Car E. S. S. Co. mechanism
Door mechanism	Hand-operated, St. Louis Car
Fenders	Railway company's, standard
Gongs	12-in., bronze pneumatic
Hand brakes	Ackley
Hand straps	Rico sanitary straps
Heaters	Peter Smith No. P-S
Headlights	Crouse-Hinds
Journal boxes	St. Louis Car
Motors	Two GE. 204—outside hung
Paint	Murphy A B C
Registers	International R-5
Sand-box with Reliance sand trap valve	
Sash fixtures	O. M. Edwards
Seats	Cross and longitudinal, Hale & Kilburn
Seating material	Rattan
Springs	Pittsburgh Steel Spg.
Step treads	Mason
Trucks	St. Louis Car 106A maximum traction
Ventilators	Automatic
Wheels	33-in. driver, 21-in. pony
Special devices	Faraday buzzers

PROFESSIONAL NOTE

John A. Beeler, consulting engineer, who has been located for the past year at 60 State Street, Boston, has moved his headquarters to the Vanderbilt Concourse Building, 52 Vanderbilt Avenue, New York City. While in Massachusetts he was engaged upon a number of important investigations and reports for the Bay State Street Railway and other companies. Mr. Beeler was formerly vice-president and general manager of the Denver Tramway System, and while with this company he demonstrated his ability to instill enthusiasm and develop the loyalty of his employees to a remarkable extent. Although there was a large number of men on the property, no strikes or labor troubles arose during his management of twenty-five years. The employees were made to realize that their prosperity was dependent upon the success and prosperity of the company. The result was a most courteous, polite and painstaking lot of men who by their bearing and treatment of the patrons established a friendly relation between the public and the company, much to the latter's benefit in every way. Mr. Beeler's experience as a constructing engineer and successful manager especially qualifies him to render valuable service where a practical solution of operating problems and difficulties are involved.

TRADE NOTES

A. M. Collins has been appointed sales manager of the Detroit office of the Western Electric Company.

Draeger Oxygen Apparatus Company, Pittsburgh, Pa., has moved from Pittsburgh to Penn Avenue and Hay Street, Wilkinsburg, Pa.

Ollard Trolley Wheel Company, Tacoma, Wash., has been incorporated with a capital of $20,000. The company will manufacture trolley wheels.

Van Dorn & Dutton Company, Cleveland, Ohio, has opened a branch office at 524 Wells Building, Milwaukee, under the management of James Gibbons, formerly manager of the Baltimore branch.

United States Electrical Manufacturing Company, Los Angeles, Cal., is putting out a new electric grinding motor, fully inclosed and provided with ball bearings. It can be supplied for bench mounting or with a special pedestal.

H. W. Johns-Manville Company, New York, has moved its Pittsburgh showrooms and sales offices to the ground floor of the Westinghouse Building, corner of Ninth Street and Pennsylvania Avenue.

Walter A. Zelnicker Supply Company, St. Louis, Mo., announces that it has secured the services of Charles H. Trapp. Mr. Trapp was formerly associated with James Stewart & Company of St. Louis and also with Terrell Croft, consulting electrical engineer, St. Louis.

Wagner Electric Manufacturing Company, St. Louis, Mo., announces the appointment of F. T. Coup, formerly connected with its Chicago office, to take charge of its Milwaukee office in its new location, the First National Bank Building.

George W. Goethals announces his association with Charles C. Jamieson, Robert E. Graham, George H. Houston, John C. Jay, Jr., and George M. Wells, consulting engineers, 40 Wall Street, New York. The name of the company will be Goethals, Jamieson, Houston & Jay, Jr.

E. C. Woodbury, for a number of years with the Standard Underground Cable Company as assistant to the manager, has resigned from that company to manage the Southwestern business of the Belden Manufacturing Company of Chicago.

Ohio Brass Company, Mansfield, Ohio, has received an order through a New York export house for overhead materials amounting to approximately $10,000. The materials will be used in rehabilitating the properties of the Mexico Tramways, Mexico City, Mexico.

Asbestos Protected Metal Company, Pittsburgh, Pa., announces the temporary closing of its Atlanta and St. Louis offices. This has been made necessary because J. R. Nichols, Atlanta manager, entered the Officers' Reserve Corps at Fort McPherson and F. C. Easterby, St. Louis manager, entered the Officers' Reserve Corps at Fort Riley, Kan.

Underwriters' Laboratories, Chicago, Ill., announce as additions to their casualty council the following: Col. Lewis T. Bryant, Commissioner of Labor of the State of New Jersey, Trenton, N. J.; Lew R. Palmer, Department of Labor and Industry, Harrisburg, Pa., and A. H. Young, director of the American Museum of Safety, New York.

Bridgeport (Conn.) Brass Company has extended to its employees a liberal plan for the purchase of Liberty bonds. It will carry the subscription of any individual in its employ for fifty months, that is, the employee may pay for his bond in instalments of 2 per cent per month of the value of his subscription. In addition the company has made a large subscription in its own ame.

Monitor Controller Company, Baltimore, Md., manufacturer of automatic starters and controllers for all kinds of motor-driven machinery, announces the opening of a new office in Buffalo, N. Y., at 718 Ellicott Square, under the direction of William G. Merowit. This office will have charge of business in the western New York territory, also Canadian territory adjacent to Toronto and Hamilton.

Railway Safety Device & Manufacturing Company, Parsons, W. Va., has been incorporated with $100,000 capital to manufacture locomotive spark arresters, safety mail cranes, and other railway specialties. The corporation was formed by Frank M. Glenn and Otis A. Miller of Parsons, Robert E. Jackson and Everett G. Livesay of Princeton, and J. A. Visquesney. The corporation has purchased 10 acres of land as a site for a foundry.

Sangamo Electric Company, Springfield, Ill., announces the opening of a San Francisco office at 37 Stephenson Street, in charge of L. A. Nott, district manager. This office will represent the Sangamo company in northern California and that part of southern California not handled by the Sangamo company's Los Angeles office. Mr. Nott is well known to the electrical fraternity on the Pacific Coast, having been connected with the Standard Underground Cable Company for many years and later with the K. P. F. Electrical Company, which association he will continue. The Sangamo company will now carry a complete stock of meters, repair parts, etc., in San Francisco, and will be prepared to service its meters in this territory. The Los Angeles and southern California district office in the San Fernando Building, Los Angeles, will continue under the direction of J. C. Monahan, district manager.

ADVERTISING LITERATURE

Van Dorn & Dutton Company, Cleveland, Ohio: A folder, "Three Trumps," referring particularly to its gears, electric tools and weldless wire chains.

Dayton (Ohio) Manufacturing Company: Catalog No. 213, describing and illustrating the latest patterns of washstands, water coolers and water and dry closets.

National Tube Company, Pittsburgh, Pa.: Classification and list adopted on June 1 on the cost of black and of galvanized malleable iron fittings made by this company.

Pennsylvania Metallic Tubing Company, Chicago, Ill.: A thirty-two-page bulletin describing and illustrating the various uses of Penflex metal hose. Contains tables giving data on vacuum tubing, fireproof tubing for light pressures and tubing for high pressures.

Crouse-Hinds Company, Syracuse, N. Y.: Catalog No. 201, 116 pages. Includes ten different types of Imperial luminous arc headlights and eleven Imperial carbon-arc headlights for electric traction service, headlights for harbor and river service, headlights for electric mine locomotives and wiring equipment, supply parts and wiring diagrams for all of the above-named headlights. Also catalog No. 202 on Imperial incandescent headlights for railway and mining service, including six types each with regular filament Mazda lamps for city service, eight types for city and interurban service and seven types for high-speed interurban service. Wiring diagrams, wiring equipment parts, and numerous catalog number indexes for all the above headlights are given.

Counsel to Managers Errant

Counsel to Irish Knights Errant ran something like this:

"You will first go to try to find out where the imprisoned damsels are. When you find out where they are you will demand them peaceably, and if you do not get them peaceably you will fight for them."

Today it reads like this:

"You will first go to try to find out where the good brakes are.

"When you find out where they are you will demand them peaceably;

"And if you do not get them peaceably you will fight for them."

Aye, **Peacock Brakes** are worth fighting for.

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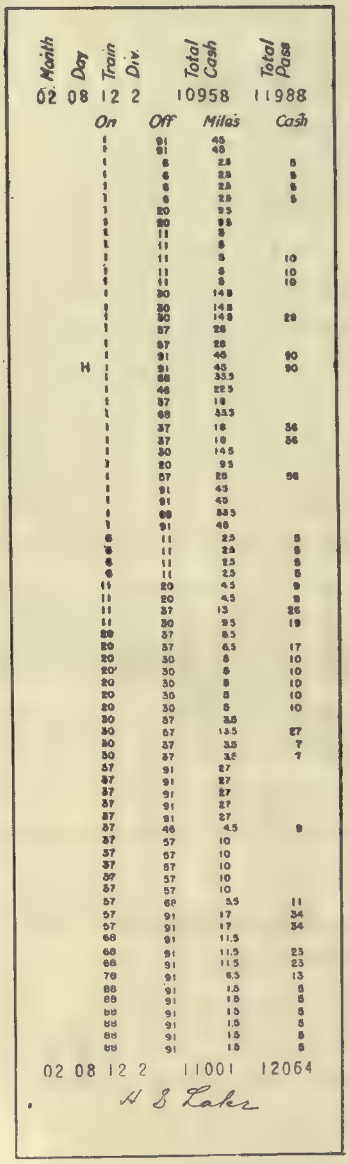


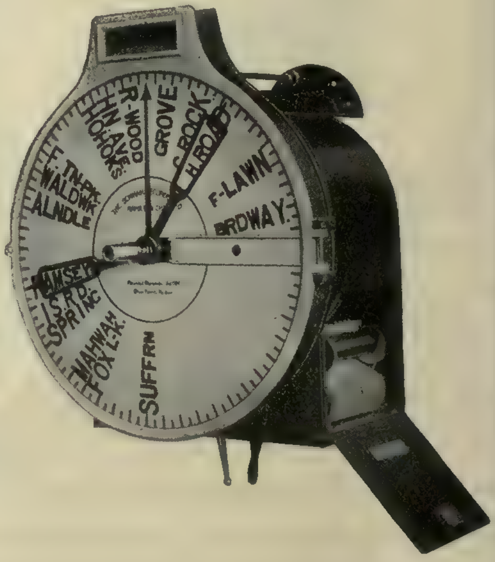
Month	Day	Train	Div.	Total Cash	Total Pass
02	08	12	2	10958	11988

	On	Off	Miles	Cash
	1	91	45	
	1	91	45	
	1	6	2.5	5
	1	6	2.5	5
	1	6	2.5	5
	1	6	2.5	5
	1	20	9.5	
	1	20	9.5	
	1	11	5	
	1	11	5	
	1	11	5	10
	1	11	5	10
	1	11	5	10
	1	30	14.5	
	1	30	14.5	
	1	30	14.5	29
	1	57	28	
	1	57	28	
	1	91	45	90
H	1	91	45	90
	1	68	33.5	
	1	46	22.5	
	1	37	18	
	1	68	33.5	
	1	37	18	36
	1	37	18	36
	1	30	14.5	
	1	20	9.5	
	1	57	28	56
	1	91	45	
	1	91	45	
	1	68	33.5	
	1	91	45	
	6	11	2.5	5
	6	11	2.5	5
	6	11	2.5	5
	6	11	2.5	5
	11	20	4.5	9
	11	20	4.5	9
	11	37	13	26
	11	30	9.5	19
	20	37	8.5	
	20	37	8.5	17
	20	30	5	10
	20	30	5	10
	20	30	5	10
	20	30	5	10
	20	30	5	10
	30	37	3.5	
	30	57	13.5	27
	30	37	3.5	7
	30	37	3.5	7
	37	91	27	
	37	91	27	
	37	91	27	
	37	91	27	
	37	91	27	
	37	46	4.5	9
	37	57	10	
	37	57	10	
	37	57	10	
	37	57	10	
	37	57	10	
	57	68	5.5	11
	57	91	17	34
	57	91	17	34
	68	91	11.5	
	68	91	11.5	23
	68	91	11.5	23
	78	91	6.5	13
	88	91	1.5	3
	88	91	1.5	3
	88	91	1.5	3
	88	91	1.5	3
	88	91	1.5	3
	88	91	1.5	3

02 08 12 2 11001 12064

H S Lake

The register dial, in plain view of the passengers, shows the stations between which fare is paid. The names on the dial are arranged in relation to the distances of the stations from the terminal points. The dial is divided into half-mile units.



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The "on" and "off" points of each passenger.

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The classification of each fare and the amount of each cash fare.

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The total passengers.

The total cash passengers.

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If you're finding any trouble whether it be in checking fares—wasting conductor's time in clerical work—depending on quickly-jotted-down data or otherwise—you can correct these faults by installing

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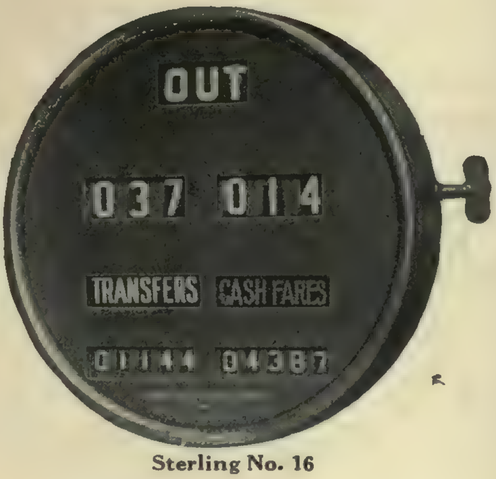

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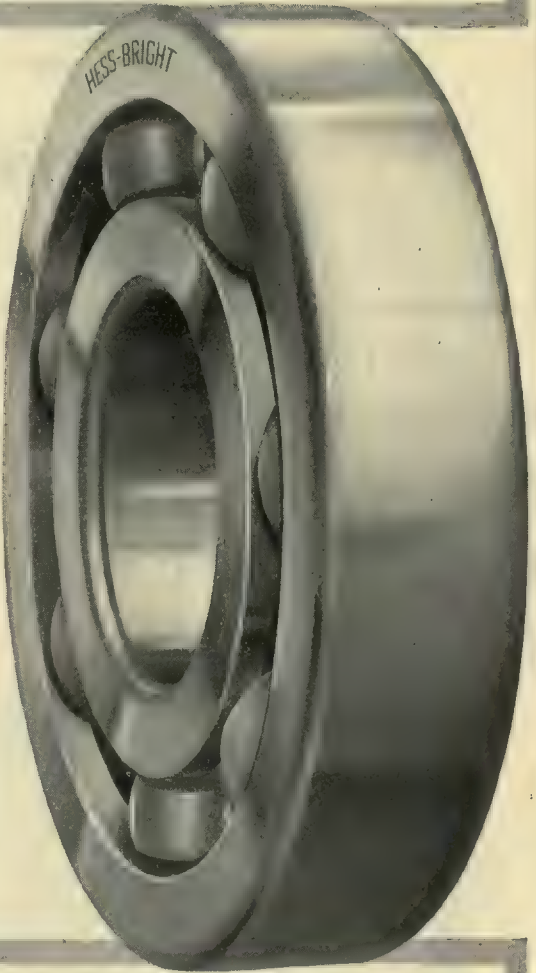

Despite the fact that at this stage the rings are only rough turned, yet they must pass a most rigid inspection before going to the hardening furnace.

Each ring is gauged within close limits for width, diameter, bore and groove diameter, not only as to dimensions but as to groove location. And notwithstanding the tests to which these rings have been subjected as bar stock, every one of them is now carefully watched for any flaws or defects in material.

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Steel Cross Ties

In making up your cross tie renewal program, have you considered the **advantage** of **substituting steel** for wood ties?

If not, we believe we can submit some **facts** that will be **interesting** to **you.**

In many instances we can show that the use of **steel ties** will **effect a saving of money.**

Our representative will be glad to confer with you and submit complete data.

The mark of quality CARNEGIE It protects the user

Carnegie Steel Company

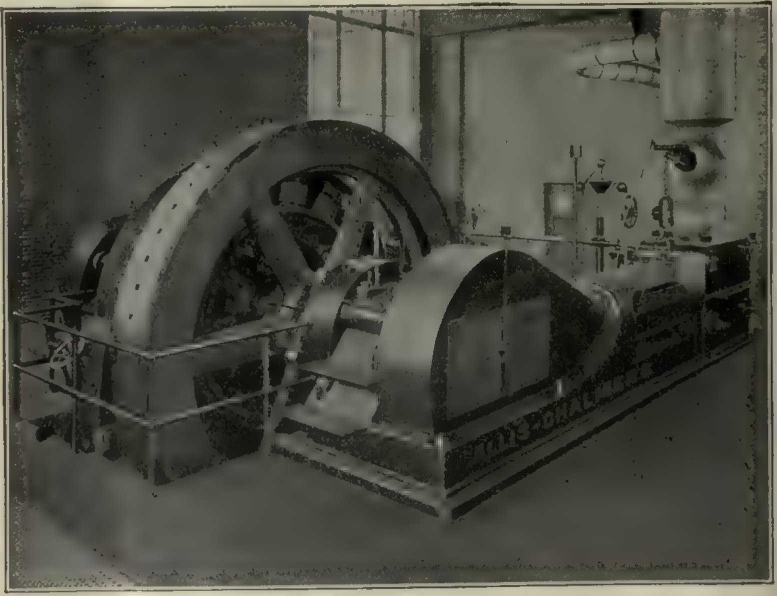
General Offices—Pittsburgh, Pa.

7-T

WE HAVE BUILT
6,000,000 HORSE POWER

STEAM ENGINES
GAS ENGINES
OIL ENGINES

We also build
Steam Turbine
Condensers
Generators
Motors, Etc.



Cross-Compound Direct-Connected Corliss Engine Unit.

Our 40 years' experience is at your service

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Packard Varnishes are the best the industry can produce for armatures, field coils, transformer coils, etc.

Twenty different varnishes for twenty different conditions and each one exactly adapted to its particular purpose.

Write for Special Varnish Bulletin—it contains valuable data on the use of Insulating Varnishes.

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ARE MADE RIGHT AND STAY RIGHT

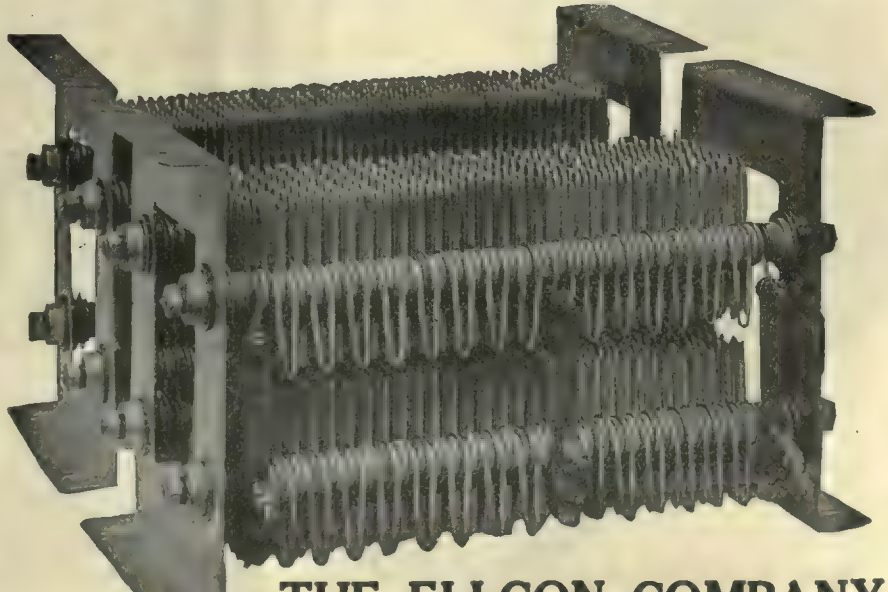
No resistors get more abuse than those under a car.

They are abused electrically by careless operation of the controller.

They are abused mechanically by exposure to dusty, muddy and stone-littered streets.

Until the arrival of E M B drawn, non-corroding grid resistors, troubles from these sources seemed unavoidable.

E M B grid resistors actually have made this part of your equipment troubleproof.



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50 Church Street, New York

Buy Service

That's what you get with More-Jones Armature Babbitt.

The most economical Babbitt is Babbitt of known quality, with service records behind it that establish its long wearing, low friction, remelting possibilities. That is

More-Jones Armature Babbitt Metal

Made by experts in mixing and alloying. Composed of pure, new metal—no scrap, no lead. Developed for that one particular service and containing all the necessary physical properties. That means strength, toughness, resistance to heat and a low rate of wear.

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Heavy slate or marble switchboards are awkward to handle and easily broken in shipment during installation or by the hard knocks of service.

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Far superior for every purpose for which stone insulating bases are used. Write for information.

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Serves more people in more ways than any other institution of its kind in the world.

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10 Factories—Branches in 55 Large Cities

The demand for our material is so great that we earnestly recommend our customers to anticipate their needs as much as possible.

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Safety—Economy—Efficiency

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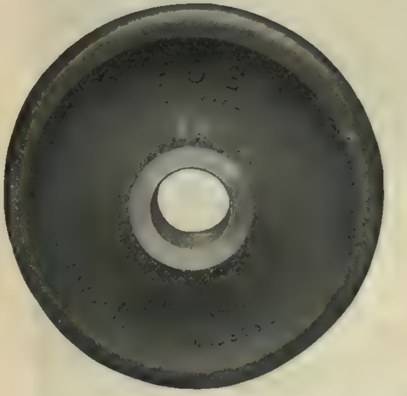

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For Street and Interurban Railways
We have adequate facilities at each foundry for mounting wheels on axles

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GEARS and PINIONS

possess the durability and easy running qualities which inevitably result from specialized gearing knowledge applied in a plant specially equipped for the production of gearing only.

All Grade *Treated* and Grade *Hardened* "Van Dorn" gearing carries a Brinell test voucher.

Let us quote. Write Dept. E. R. J.

THE VAN DORN & DUTTON CO.

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SALES OFFICES:
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make up the latest equipment of the

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They represent high standards of workmanship combined with most modern construction.

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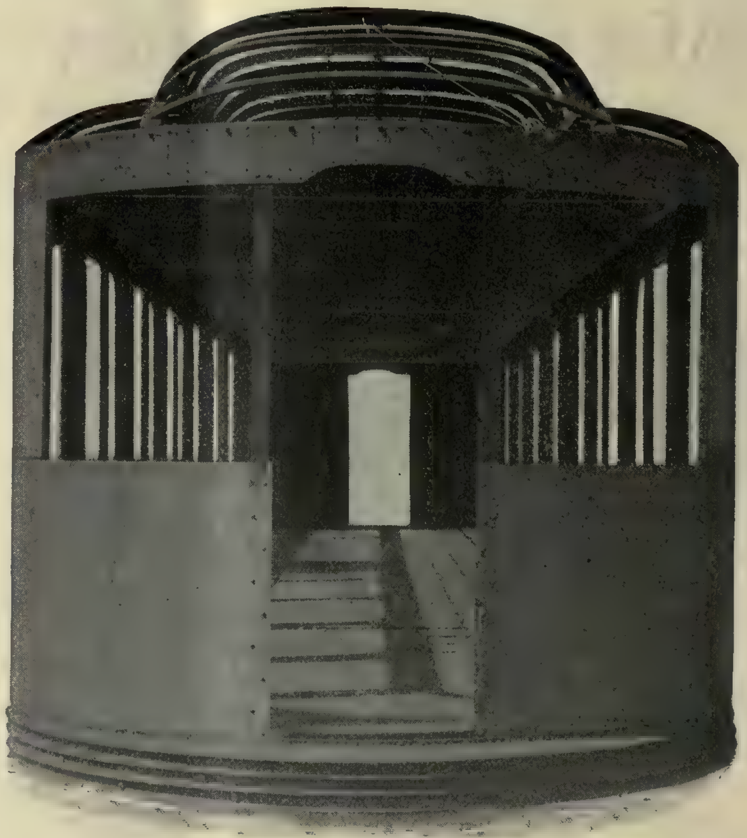
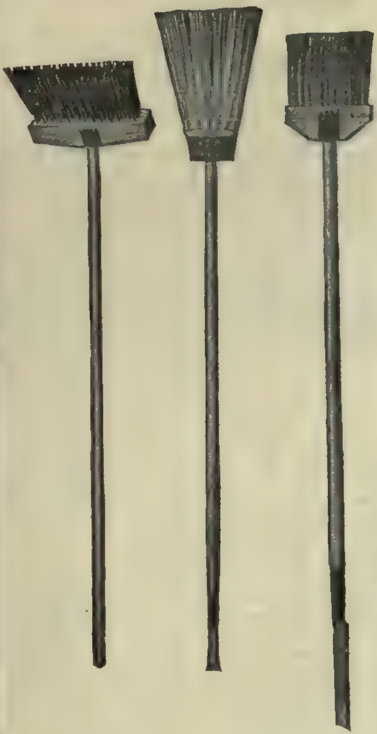
Newark, Ohio



A Great Combination



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No. 2 to handle light dirt and snow in the frogs, switches, and curves.

No. 3 to remove ice, slush and mud from the same places and a chisel point on the end of the handle to loosen the ice and crust.

No. 1 and No. 3 contain Flat Steel Tempered Wire, and nothing superior can be produced. Serviceable all the year round. Your road is not complete without them.

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Strongest STEEL POLE of like weight in the world.

Best STEEL POLE in the world for electric railway trolley service.

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We make the lowest prices.

We have constantly on hand about two thousand tons of steel and can make immediate shipments.

A full line of convenient malleable fittings.

Our steel pole TREATISE tells a big story, ask for it.

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Railway Feeders

And all kinds of Electrical Conductors

Aluminum feeders are less than one-half the weight of copper feeders and are of equal conductivity and strength. If insulated wire or cable is required, high-grade insulation is guaranteed. Write for prices and full information.

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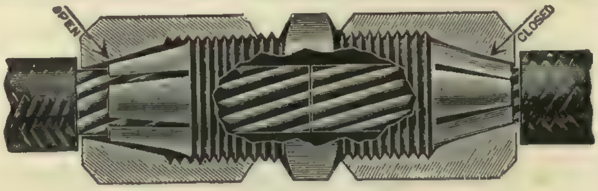

Makes Splices Easy to Open Up, Too

All you need is a wrench to open up a splice or make it up again, if you use

FRANKEL SOLDERLESS CONNECTORS

Wonderfully simple; Mechanically and electrically strong. Withstand big overloads. **Get our booklet.**

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Direct Contact Between
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for all classes of electrical construction and repair work. Write for catalog.
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TREATED POLES, CROSS ARMS, TIES, TIMBERS, PAVING BLOCKS
CAPACITY 100,000,000 FEET B. M. PER ANNUM
SEND FOR PAMPHLET
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Address all communications to Office, Galveston, Texas
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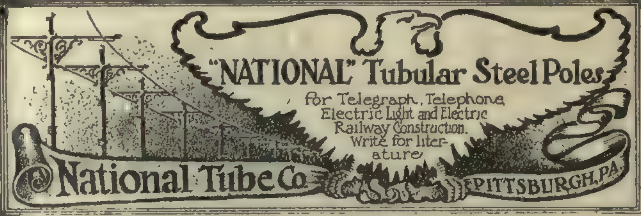
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for Telegraph, Telephone, Electric Light and Electric Railway Construction. Write for literature
National Tube Co
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Three Section Tower Outfits to fit any make of chassis.
Write for literature and prices.
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Beats Solid Copper 40 Ways
Cheaper—Lighter—Stronger—Higher Elastic Limit—Costs Less to Maintain
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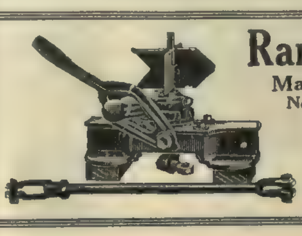

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Main Office, Hillburn, N. Y.
New York Office: 30 Church St.
Automatic Switch Stands, T-Rail Special Work, Manganese Construction, Crossings, Switches, Etc.

HIGHEST QUALITY

TRACK SPECIAL WORK

WE MAKE THIS GRADE ONLY

CLEVELAND FROG & CROSSING CO.
CLEVELAND OHIO

AWARDED
PANAMA PACIFIC INTERNATIONAL EXPOSITION GRAND PRIZE

American Rail Bonds

Crown
United States
Twin Terminal
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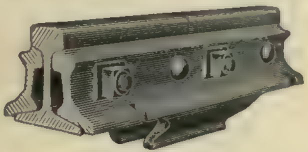

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Makers of Continuous, Weber, Wolhaupter and 100% Rail Joints
Standard—Insulated—Step—Frog and Switch Types
Protected by Patents
Grand Prize, San Francisco, 1915

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offer all the advantages without the disadvantages of the groove rail.
Construction approved by City Engineers.
THE NELSONVILLE BRICK CO., Nelsonville, Ohio

Kilby Frog & Switch Co.
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Tongue Switches, Mates, Frogs, Curves and Special Work of all kinds for Street Railways

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This illustration tells its own story.

You see the upper sections of "ACME" (Nestable) Corrugated NO-CO-RO METAL Culverts resting on the concrete floors and side walls.

You see the advantages: Permanent construction and the fact that—

Any desired water-way can be secured by simply altering the height of design of concrete walls.

To be sure "ACME" Culverts need not be reinforced with concrete in regular practice.

But when conditions demand it they prove worthy allies—for eternity!

Write for Catalog G-3 and get the full story.

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MANUFACTURERS
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SPECIAL TRACK WORK
Built to withstand severe service

SWITCHES
FROGS
CROSSINGS
and
COMPLETE
LAYOUTS

New York Switch & Crossing Co.
Hoboken, New Jersey

Oxweld Acetylene Co.

Largest Makers of Oxy-Acetylene Welding and Cutting Equipment in the World.

Originators of the Oxweld Process

Full information on all classes of Welding and Cutting will be sent on request.

Oxweld Acetylene Company
CHICAGO, ILL. NEWARK, N. J.

Have You Ever Analyzed the Heap of Junk in Your Yard?

Do you realize that a large percentage of the tubes, flues, and grates that compose it have had their uselessness hastened by bad feed water conditions?

Scale, Corrosion, Foaming, Pitting and Bagging quickly reduce boilers to junk. Overheating in an effort to offset the reduced steaming efficiency caused by scale, speedily burns out the tubes, and steam leaks produce bad effects on the grates, and also have a tendency to destroy the brick work of the furnace.

It is therefore easily appreciable that

Dearborn Treatment

which is a certain corrective for all feed water troubles, prolongs the life of not only the water containing parts of your boiler, but saves furnace parts as well.

Dearborn Treatment can be depended upon to keep the boilers in good condition. It is made in each case to handle the conditions shown by analysis of the water, and provides reagents for all the injurious mineral salts contained, so that it not only prevents scale formation, but overcomes corrosion, pitting and foaming.

Dearborn Chemical Company
McCormick Bldg., Chicago

Repair Shop Machinery and Cranes

Built by

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111 Broadway, New York

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Full power with
High or Lower Adjustment

Many emergencies requiring a powerful jack present a difficulty in bringing the jack to bear on the load. The

Buckeye Emergency Jack No. 239 Special

saves time, strength and trouble. The many positions to which it is adjustable easily solve perplexing lifting problems. Full details in our catalog. Write for it.

The Buckeye Jack Mfg. Co.
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The Babcock & Wilcox Company

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Steam Superheaters Mechanical Stokers

Works: BARBERTON, OHIO—BAYONNE, N. J.

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CIRCUIT BREAKERS
I-T-E

I. T. E. Circuit Breakers

for heavy street railway work are the best obtainable. Write for New Complete Catalogue.

DIXON'S Graphite Brushes

overcome the scoring of commutators and the resulting noise and sparking.
If you have brush troubles, Booklet 108-M will be of interest to you.

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JOSEPH DIXON CRUCIBLE COMPANY
Established 1827

Murphy Automatic Furnace

CONSERVES energy and triples the steaming capacity of your boilers. Write for Catalog "C."

MURPHY IRON WORKS
Detroit, Mich. U.S.A.

232

GECO PATENTED APPLIANCES

GREEN CHAIN GRATE STOKERS
For Water Tube and Tubular Boilers

GREEN ENGINEERING CO.
East Chicago, Indiana

Bulletin No. 1—Green Chain Grate Stokers
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These poles are of high grade special skelp, properly reinforced, and will sustain a wheel pressure of from 35 to 40 pounds without taking a permanent bend.

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The National Standard
for Car Curtains and
Car Upholstery

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The only headlining made in one solid piece. Will not separate, warp or blister. Waterproof and homogeneous.

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have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.

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Sole Manufacturers

"HONEYCOMB" AND "ROUND JET" VENTILATORS
for Monitor and Arch Roof Cars, and all classes of buildings; also
ELECTRIC THERMOMETER CONTROL
of Car Temperatures.

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Barrett Track and Car Jacks
Barrett Emergency Car Jacks
Duff Ball Bearing Screw Jacks
Duff Motor Armature Lifts

The Duff Manufacturing Co., Pittsburgh, Pa.

Use them in your terminals—
PEREY TURNSTILES
or PASSIMETERS

Faster than the ticket seller

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Globe Ventilator Co., Troy, N. Y.

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You get the advantage of our constant effort to improve our product for your service.

You get the earnest co-operation of our engineers to assist you in getting the full quota of service from each Brake Shoe applied.

Miles of service from the Brake Shoe are more to be desired than pounds of scrap.

All of which means increased efficiency and decreased cost of Brake Maintenance.

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McCormick Bldg., Chicago **Chattanooga, Tenn.**

Are you interested in an

All-Steel
Double Truck
Car

seating 46 people
and weighing
complete 26,000 pounds?

If you are,
write us
"The Quality Shops"

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Car Company

The Baldwin Locomotive Works

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ELECTRIC MOTOR and TRAILER TRUCKS

LONGWEAR BUSHINGS
For Brake Gear

Hardened
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Accurate
Uniform

also
LONGWEAR
BRAKE PINS
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Specifications

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MASON SAFETY TREADS—prevent slipping and thus obviate damage suits.

KARBOLITH CAR FLOORING—for steel cars is sanitary, fireproof and light in weight.

STANWOOD STEPS—are non-slipping and self-cleaning.

Above products are used on all leading railways. For details address

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VAN DORN COUPLERS
are made for every condition and requirement. M. C. B. Pin and Link, Car and Air, in all sizes and types.
VAN DORN COUPLER CO.
2325 So. Paulina St., Chicago, Ill.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

More than 300 different products are here listed. The Alphabetical Index (see eighth page following) gives the page number of each advertisement.

As far as possible advertisements are so arranged that those relating to the same kind of equipment or apparatus will be found together.

This ready-reference index is up to date, changes being made each week.

If you don't find listed in these pages any product of which you desire the name of the maker, write or wire Electric Railway Journal, and we will probably furnish the information.

Acetylene Apparatus.
(See Cutting Apparatus, Oxy-Acetylene.)

Acetylene Service.
Oxweld Acetylene Co.

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Horne Mfg. Co.

Alloys and Bearing Metals.
(See Bearings and Bearing Metals.)

Alloys, Steel and Iron.
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Ohio Brass Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Automobiles and Buses.
Brill Co., The J. G.

Axles.
National Tube Co.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
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Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The
Western Electric Co.

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National City Co.

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Johns-Manville Co., H. W.
Western Electric Co.

Batteries, Storage.
Electric Storage Battery Co.
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Baldwin Locomotive Works.
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Bearings, Roller and Ball.
Gurney Ball-Bearing Co.
Hess-Bright Mfg. Co.
Railway Roller Bearing Co.

Bearings, Roller Side.
Holden & White, Inc.

Bells and Gongs.
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Western Electric Co.

Benders, Rail.
Niles-Bement-Pond Co.
Western Electric Co.
Zelnicker Sup. Co., W. A.

Blow Torches for Soldering and Brazing. (See Cutting Apparatus, Oxy-Acetylene.)

Blowers.
General Electric Co.
Westinghouse Elec. & M. Co.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Dearborn Chemical Co.
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Boiler Coverings.
Johns-Manville Co., H. W.

Boiler Tubes.
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Bond Clips.
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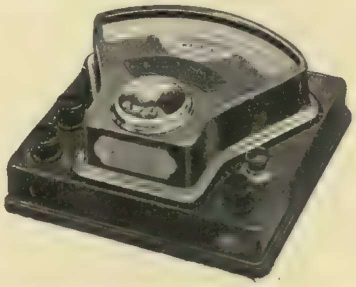

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READY-REFERENCE INDEX

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Heaters, Car (Hot Water).
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Anderson M. Co., A. & J. M.
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Scaife & Sons, Wm. B.

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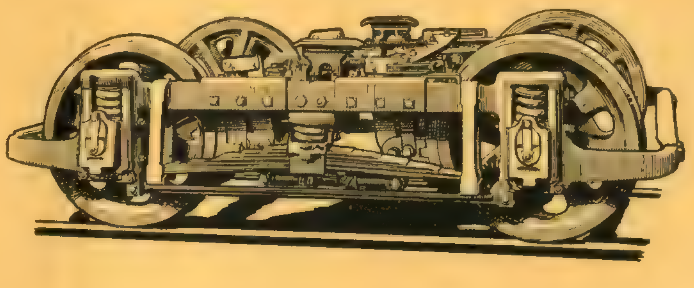

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The C P-27-B Compress
used on the new Youn
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6502

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ELECTRIC RAILWAY JOURNAL

New York, June 16, 1917 McGraw-Hill Publishing Co., Inc. Vol. 49, No. 24 10c a copy

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ELECTRIC RAILWAY JOURNAL

H. W. BLAKE, Editor

VOLUME XLIX, No. 24 **NEW YORK, JUNE 16, 1917** PAGES 1079 TO 1124

CONTENTS

Typical Car-Yard Improvements at Rochester, N.Y.

Simplicity, reasonable cost, ample fire protection and complete utilization of site are features of new shop and revised storage track layout at New York State Railway's Portland Avenue yard, which are described by D. J. Graham................................Page 1082

Selling "Public Service" to a Whole State

The methods and means by which New Jerseyites have been led to become acquainted with the manifold activities of the great utility of that state ....Page 1085

Method for Determining the "Slack" in a Schedule

C. H. Koehler offers a novel "service-characteristic" diagram as a means of showing at a glance the character of the "performance of any given class of car equipment regardless of variations in operating conditions" ....Page 1088

EQUIPMENT AND ITS MAINTENANCE....1099

Electric Railway's Own Forces Construct and Erect Bridge—*By H. V. Norford.*
Large Steel Sheets Drilled by Aid of Home-Made Carriage—*By G. B. Sisson.*
Linemen Criticize Each Other's Work by Aid of Photographs.
Derailments Reduced by Investigation, Classification and Study of Causes—*By M. Bernard.*
Keying Bearing Brasses Eliminates Dowel Pins.
Substation Operating Rules.
How Many Points of Heat?
Home-made 4000-lb. Air Hoist for the Wheel Yard.
Concrete Paving Laid Where Use of Expensive Material Was Not Justified—*By D. P. Falconer.*
Cost of Erecting Overhead Work—X.
Black-Dial and White-Dial Meters.
Convenient Method for Furnishing Light to Repair Gangs.
A Condulet Designed for Safety First.
New Rivet-Cutting Attachment for Oxy-Acetylene Torch.

EDITORIALS 1079

Air Supremacy Cheap at Half a Billion.
Taking Advantage of Economy Kinks.
Displacing the Isolated Plant.
Slack in Schedules and Energy Input.
Saving Fuel Is a Patriotic Duty.
Car Depreciation.
A Message from the Other Side.
Higher-Fare Problem Inherently Simple.

HANDLING COMPLAINTS FROM PATRONS..1090

UP-STATE NEW YORK LINES NEED RELIEF—II 1092

MUNICIPAL REGULATION OF STREET RAILWAYS 1095

AMERICAN ASSOCIATION NEWS.........1097

RAILWAY SIGNAL ASSOCIATION MEETS...1097

BIG COTTONWOOD DEMOLISHES ONE-MAN CAR 1097

COMMUNICATION 1098

Advocates Springs Over Journal Boxes.

SELLING RIDES IN MINNEAPOLIS........1098

NEWS OF ELECTRIC RAILWAYS..........1107

Outcome in Philadelphia Uncertain.
Montreal Men Get Increase.
Washington Inquiry Nearing End.
Tunnel-Bridge Commission Appointed.
Pacific Electric Railway Problems.
Cyclone Hits Michigan Line.
Estimates of Extensions Under Way.
Renewal of St. Louis Negotiations Likely.
Denver Brotherhood Pledges Loyalty.
Chicago Wage Situation.
Chicago Bills Before House Committee.

FINANCIAL AND CORPORATE...........1111

$23,000,000 Additional Needed.
San Francisco Reorganization Approved.
Sale of Northern Electric Unlikely.
Oklahoma Valuations Fixed.
Returns for Nebraska Lines.

TRAFFIC AND TRANSPORTATION.........1114

Los Angeles Excludes Jitneys.
Rate Dispute in Illinois.
Key Route Asks Fare Increase.
More Skip Stops in Baltimore.
L. I. R. R. Seeks City Fare Increase.
Why Holyoke Road Asks Increase.

LEGAL NOTES 1118

PERSONAL MENTION 1118

CONSTRUCTION NEWS 1119

MANUFACTURES AND MARKETS..........1121

JAMES H. MCGRAW, President
ARTHUR J. BALDWIN, Vice-President and Treasurer
E. J. MEHREN, Vice-President and General Manager
JAMES H. MCGRAW, JR., Secretary

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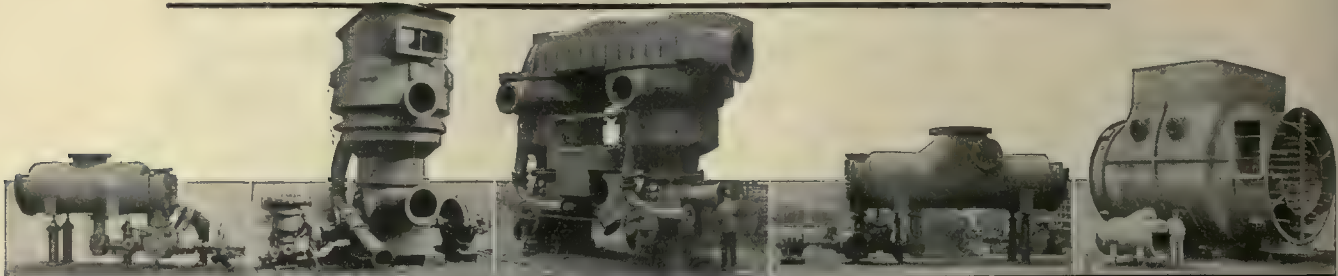
Westinghouse

Jet and Surface Condensers



Their Performance Has Given Them

A World-Wide Reputation For Reliability and High Vacua

This has taken them to many distant countries. The simple rugged construction of Westinghouse Condensers makes them particularly desirable for installation in remote localities where reliability is a factor of utmost importance.

In the ability to maintain very high vacuum continuously, Westinghouse Condensers remain unexcelled. The Westinghouse Leblanc Air Pump contributes materially to this high efficiency.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

The Westinghouse Leblanc Air Pump

with which all Westinghouse Condensers are equipped, is like a bright, new dipper in its operation. Every water piston is a dipper-full out—with no back drip. The water pistons follow each other in such rapid succession that the removal of air is as sure and as constant as the law of gravitation.

This is one of the "secrets" of the

High Vacuum

and the satisfactory operation of our Condensers.

Westinghouse
Electric & Mfg. Co.
East Pittsburgh, Pa.

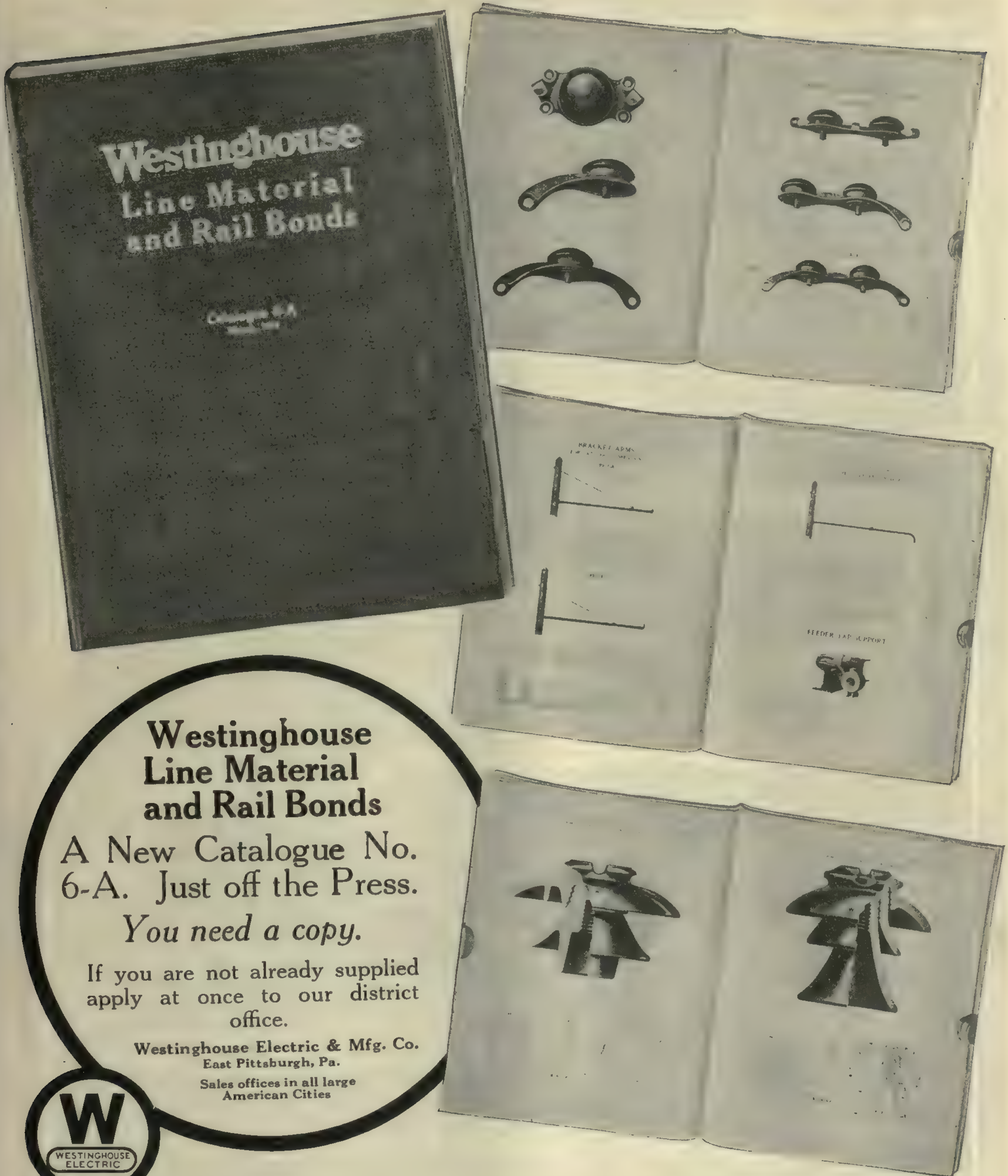
The Westinghouse Leblanc Air Pump

The construction of The Westinghouse Leblanc Air Pump is so simple and rugged that it is not damaged by the small debris that may pass through it with the raw condensing water. Therefore the water strainer used is intended simply to catch and hold—

THE BIG THINGS

—that may, by accident find their way into the water supply.

All Westinghouse condensers are equipped with the Leblanc Air Pump.



Westinghouse Line Material and Rail Bonds

A New Catalogue No. 6-A. Just off the Press.

You need a copy.

If you are not already supplied apply at once to our district office.

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

Sales offices in all large American Cities

W
WESTINGHOUSE ELECTRIC

Westinghouse

The

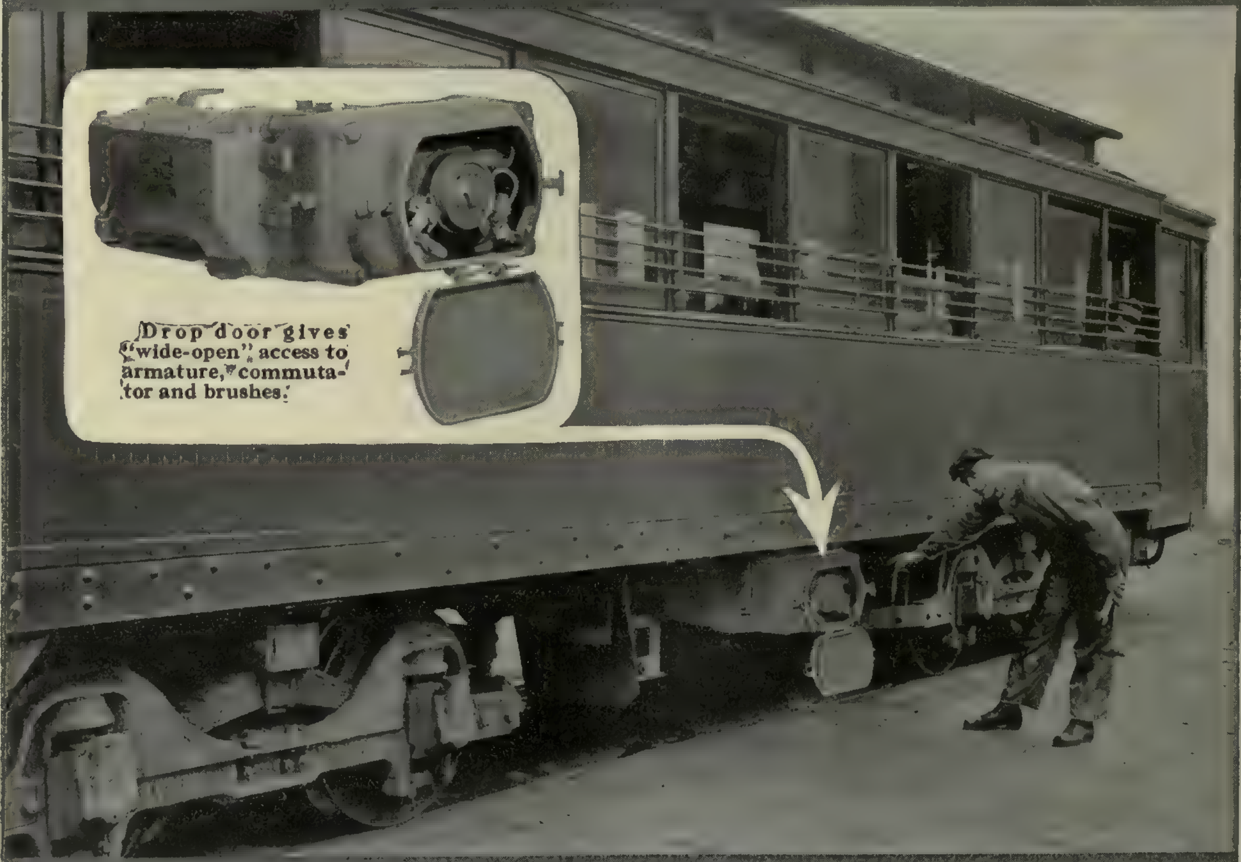
Westinghouse "Bungalow"

compressor is an Air Brake Specialist's product and is adopted as standard on many electric railways, because:

First; best possible design to perform the work readily and efficiently.

Second; best materials, careful workmanship, rigid inspection and test.

Third; maintenance facilities carefully considered and liberally provided.

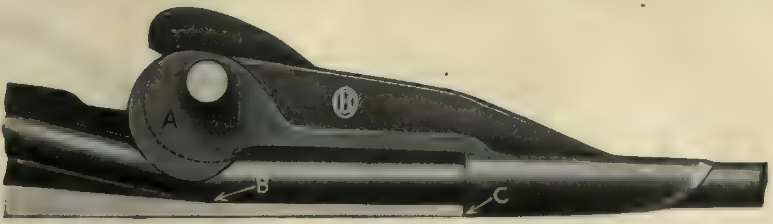


Drop door gives "wide-open" access to armature, commutator and brushes.

Westinghouse Traction Brake Company

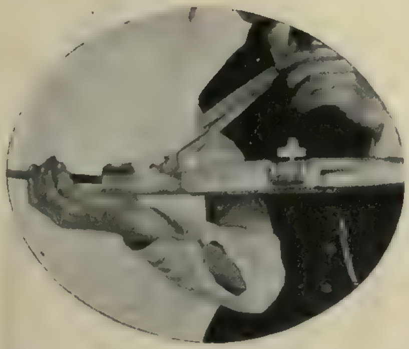
General Offices and Works: Wilmerding, Pa.

Atlanta, Ga.
Boston, Mass.
Chicago, Ill.
Columbus, O.
Denver, Col.
Houston, Tex.
Los Angeles,
Mexico City
New York, N.Y.
Pittsburgh, Pa.
Seattle, Wash.
San Francisco,
St. Louis, Mo.
St. Paul, Minn.

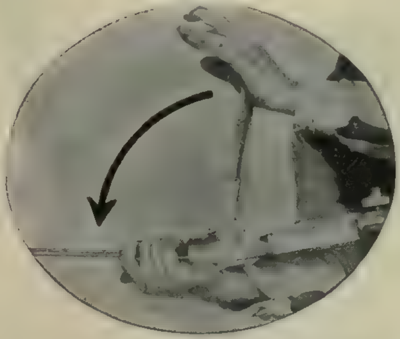


O-B Cam Tip (Patented) installed
End of device sectioned to show cam action

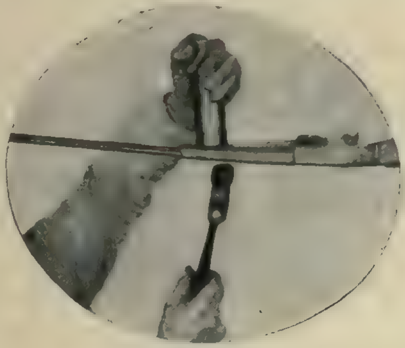
Standardize on O-B Cam Tips



Slip tip under hooks—



Turn over and down on the wire—



clinch the lips—

and the job is done

Glance over the illustrations at the left. It is obvious that O-B Cam Tips are installed in much shorter time than other styles.

But that is not all, for they are made of ductile bronze so that they hug the wire snugly and make a smooth approach for the wheel. They are tough enough and heavy enough to give satisfying life. If renewal becomes necessary it is accomplished with the same ease and rapidity as the initial installation.

You can standardize on O-B Cam Tips. They are interchangeable on the following O-B Products:

Type C Section Insulator
Type E Frog
Type D Frog
Type E R Live Rigid Cross-Over
(8°, 15°, 23°, 35°, 90° angles)
Type E Live Adjustable Cross-Over (any angle)
Type C. Insulated Adjustable Cross-Over
(any angle).
Type B Strain Plate.

Catalog No. 16 describes them.

The Ohio Brass Co.

Mansfield, Ohio

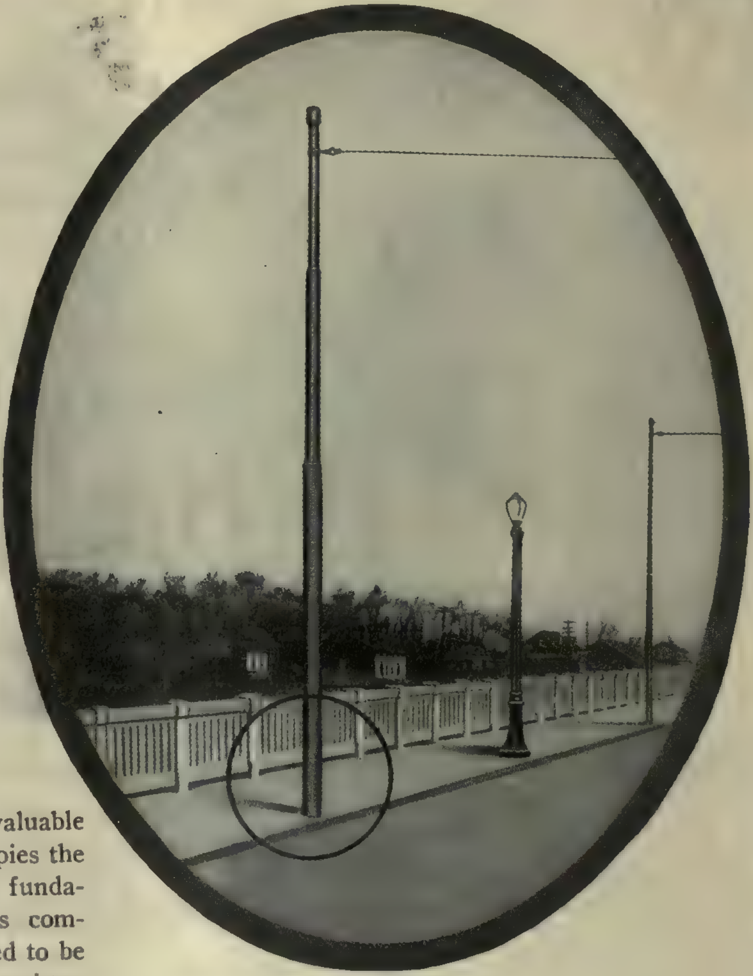
The ELRECO

Tubular Pole

is the Safest

and

Least Cumbersome



In cities where sidewalk space is valuable there is demand for the pole that occupies the smallest ground area. When this fundamental—the smallest ground area—is compounded by many other points conceded to be meritorious, you have the specifications written for Elreco Tubular Steel Poles.

Children cannot climb them.

Teamsters cannot readily use them for a hitching post.

They offer slight opportunity for hubs of vehicles to engage them in passing.

They offer unexcelled ease in painting.

They surpass every other form and shape of pole in uniformity and in their ability to withstand strains in all directions.

An Elreco Tubular Pole occupies but 34½ sq. in. at the ground line. For your own edification, compare these figures with those of poles other than Tubular.

These are but a few of the many reasons why Elreco Poles have been used so extensively by leading street railways throughout the world. In theory as well as in practice, these poles are conceded to be rightly designed. Likewise they are the safest and the most serviceable.

Let us have your inquiries for your present and future requirements.

ELRECO Tubular Poles

Combine

Lowest Cost
Lightest Weight
Least Maintenance
Greatest Adaptability

Electric Railway Equipment Co.

Cincinnati, Ohio
New York: 30 Church St.

Join the American Army

For Labor Conservation

Keep Up Track Construction Schedules
With 50% Less Labor

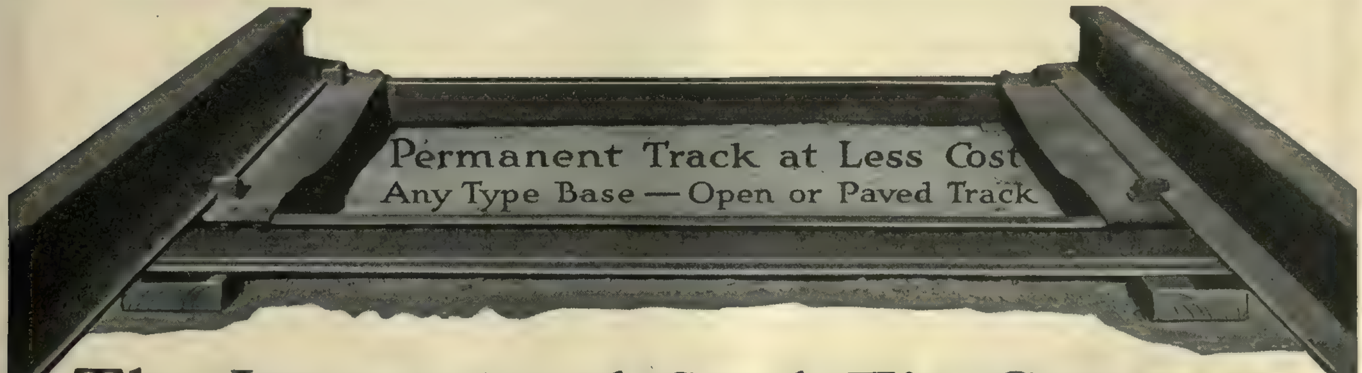
INTERNATIONAL
STEEL TWIN TIES

Will Enable You To Do This

They also cut the initial cost of track building and reduce maintenance to a minimum. The original users of steel twin ties report that installations put in service in 1909-1910-1911 have no maintenance charges against them.

Track in service, mind you, for eight years and not a cent spent for maintenance. That would be an enviable record for the most expensive track ever built. But International track costs less than any other permanent type of construction. It cuts costs and reduces labor. This is not fiction but a fact which can be verified by any of our users.

Let us prove it to you. ***Prompt deliveries made from stock.***


Permanent Track at Less Cost
Any Type Base — Open or Paved Track

The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations
General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co., Los Angeles, Cal.
San Francisco, Cal. Seattle, Wash.
R. J. Cooper Co., Salt Lake City, Utah.
J. E. Lewis & Co., Dallas, Texas.
Maurice Joy, Philadelphia.
William H. Ziegler, Minneapolis, Minn.

Phono-Electric

—the one choice for curves

The collection of current at 11,000 volts for a trailing load of 3250 tons at 14 miles an hour up a 3 per cent grade is no child's play at any time.

On curves it is a real problem, because of the canted position of the contact wire and the extra side play of the pantographs.

Under such conditions steel wire rapidly "arcs" out while copper rapidly wears out.

The choice of Phono-Electric for such a situation is based upon its dominant qualities of toughness and homogeneity, also the degree of ductility which permits it to be lined up on curves and to take excessive pounding without crystallization.

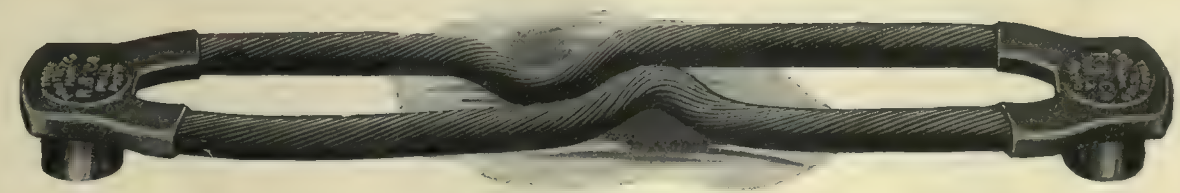
Bridgeport Brass Company

Bridgeport Connecticut

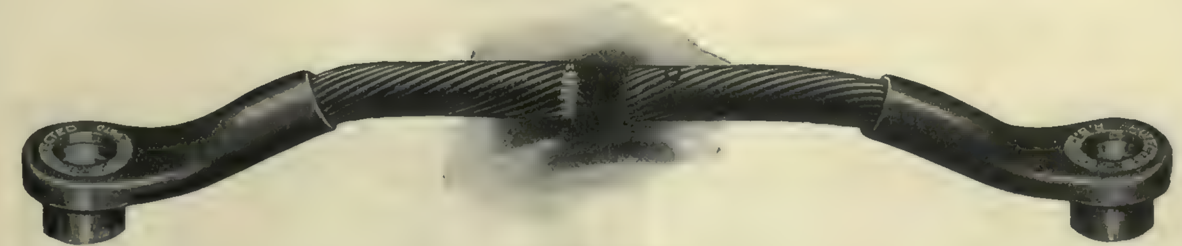
Forged Terminals, Shot-over Sleeves and a body of Flexible Strands—Your Reasons for using—

"Protected" Rail Bonds

Ask for your copy of our Catalog on "Protected" Bonds—it's a treatise on bonding.



Type F C Bond



Type P 4 P Bond

ELECTRIC SERVICE SUPPLIES CO.

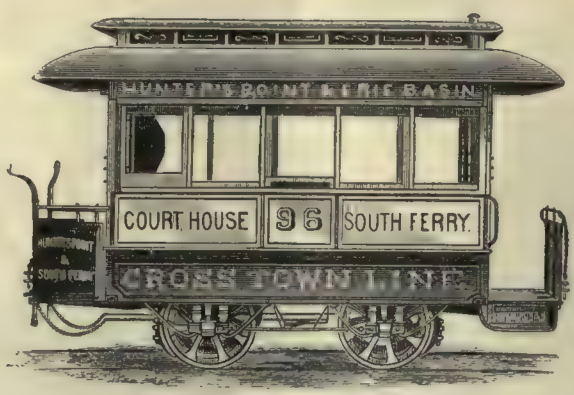
Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto



Progress!

One of the accompanying illustrations is from an advertisement of J. G. Brill & Company in Vol. I, No. 1 (November, 1884) of the Electric Railway Journal, then known as the Street Railway Journal.

The other illustration is from an advertisement of the same manufacturer in a very recent issue of the Journal. Some progress!

THE entire electric railway industry is constantly and rapidly progressing. Are you? Are you right up to the minute on the events, thoughts and tendencies of today?

If you are depending on a copy of the Journal which is shared with half a dozen other officials, the chances are that you do not read it carefully every week.

If you take your own personal copy, say at your home, and spend part of one evening a week going over it carefully, you can't fall behind. You will go ahead and lead the progress makers.

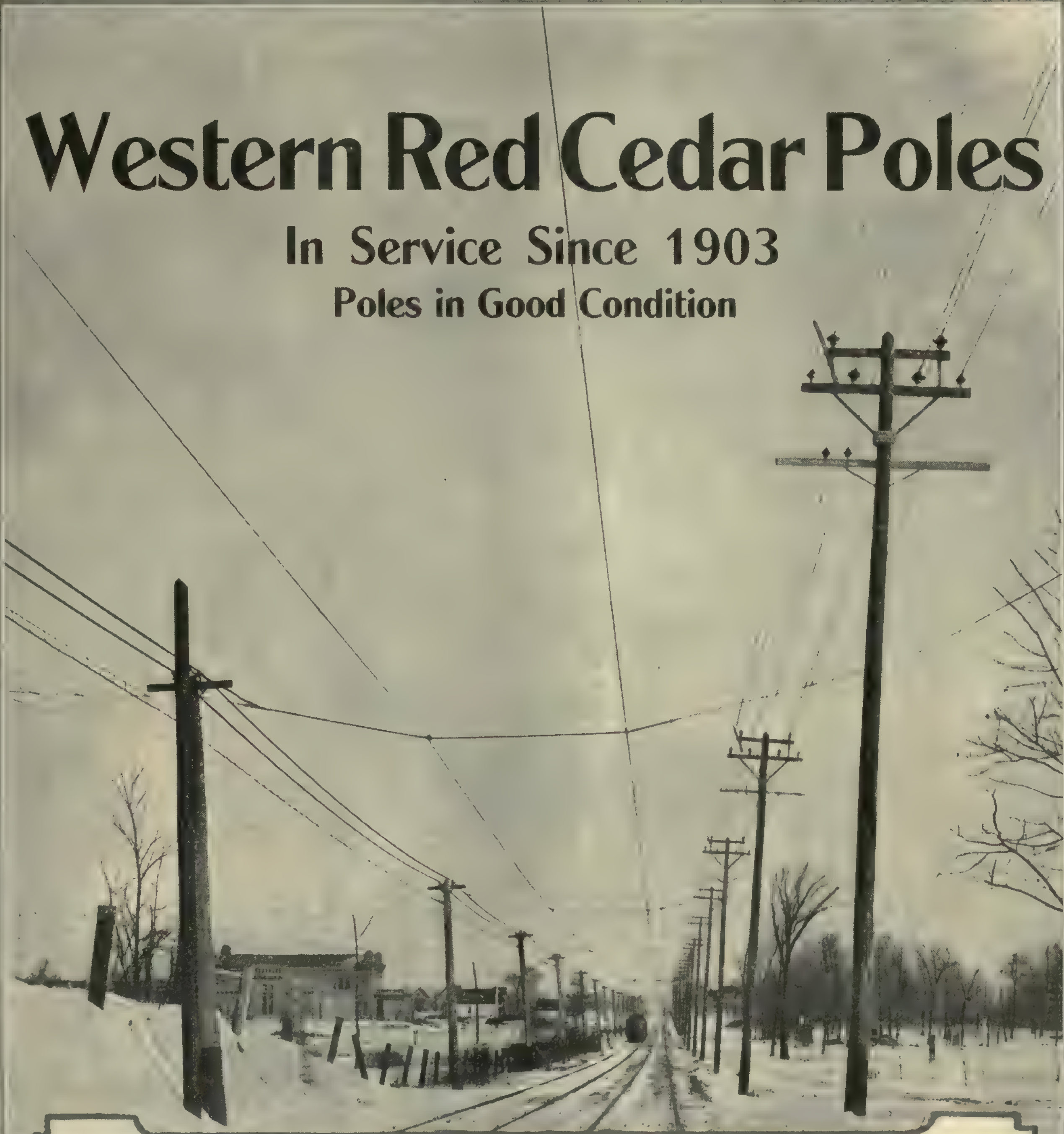
The investment is only $3 a year. You can make the returns unlimited if you use the paper in the right way. If you are not already a subscriber, send us your order today.

Electric Railway Journal, 239 West 39th Street, New York

Western Red Cedar Poles

In Service Since 1903

Poles in Good Condition



These Western Red Cedar Poles in the lines of the Milwaukee Electric Railway & Light Company, between West Allis and Milwaukee, were set in 1903 and are in good condition today. These poles are 45 ft. 7 in. tops and they support:

2—13,200-Volt Transmission Lines. One of these operates on the 25 Cycle System, and the other line on the 60 Cycle System. The 25 Cycle line is 4/0 equivalent aluminum, while the 60 Cycle line is No. O. A. W. G. Copper.

Primary and secondary distribution wires as well as several 500,000 C. M. wires.

Weather-proof railway feeders and span wires.

There are many Western Red Cedar Pole lines in different sections of the country, which have been in service fifteen years or more, carrying heavy loads and standing heavy pull, with the poles still in good condition and good for years more of service.

The Universal Poles for Universal Service

WESTERN RED CEDAR ASSOCIATION

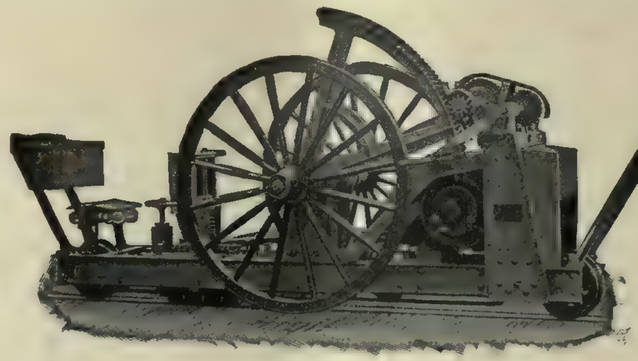
Peyton Building Spokane, Washington

Insure Continuously Good Track Conditions

Exhaustive and interesting studies made at Chicago a few months ago to determine the relative amount of development of corrugations in different kinds of track brought out some very pertinent data.

Chief among these were the facts that corrugations develop regardless of the kind of track foundation used, and that they develop in very new as well as in old track.

This shows very clearly the essential maintenance value in grinding out incipient corrugations with the



Reciprocating Track Grinder

because if, as the investigation shows, corrugations may develop in any kind of track and in new as well as old rails, it is essential to cure the condition **promptly** before it does serious and continuous damage.

The experience of scores of railways clearly shows that the surest, cheapest and most effective method of eliminating corrugations, cupping, and uneven joints is to employ the Reciprocating Grinder—the grinder that gives exact results with common labor and does the work rapidly without any interference to traffic even under very congested traffic conditions.

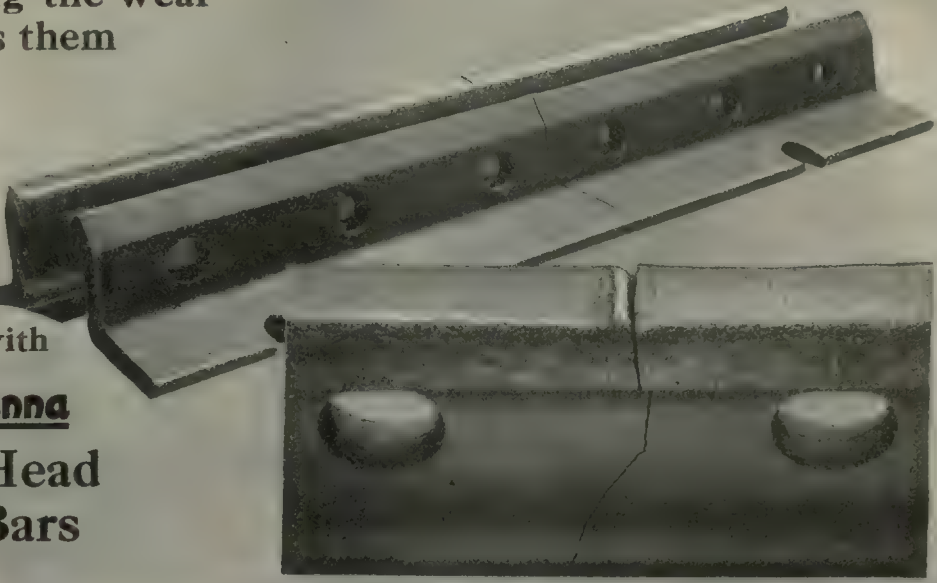
Our figures and data are at your service.

Railway Track-work Co.

30th and Walnut Streets, Philadelphia

Stop your splice bar fractures

**by avoiding the wear
that makes them
start!**



**You do this
by equipping with**

Lackawanna

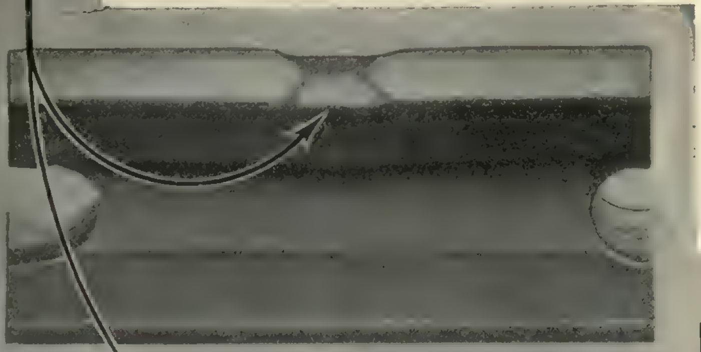
Safety-Head Angle Bars

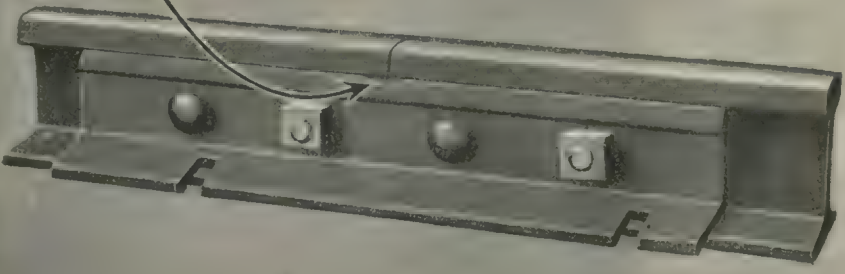
Angle bar fractures originate mainly in wear and cutting at the top, the break then apparently developing from the back action or upward thrust of the rail ends.

The Lackawanna Safety Head Angle Bar overcomes the liability to break by eliminating the initial causes. This is accomplished by depressing the metal in the head of the angle bar for a short space at the center where the rail ends meet, so that the bar will not be cut or worn by the action of the sharp under corners of the rail heads at the ends. The metal in the angle bar therefore retains its original skin and finish without destruction or upsetting under the pounding of the wheels at the joints, and in this condition is able to resist the severe strain due to the upward thrust of the rail ends caused by the passing loads.

A trial of Safety Head Angle Bars where the ordinary kind have given most trouble will soon prove our construction capable of big savings and greater safety. Write for further information.

*Ask for Our Booklet
"Improved Track Appliances"* 291

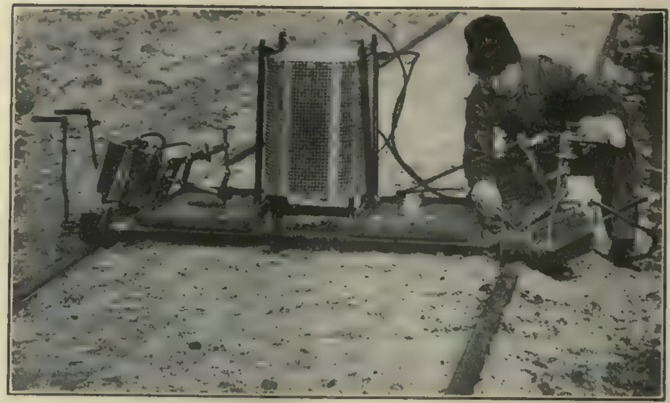




Lackawanna Steel Company

LACKAWANNA, N. Y.

ATLANTA
BOSTON
BUFFALO
CHICAGO
CINCINNATI
CLEVELAND
DETROIT
NEW YORK
PHILADELPHIA
ST. LOUIS
SAN FRANCISCO
HAVANA



The Erico Bonding System
Is Now Universally Applicable

The famous Erico Bond has now been made available for universal application—regardless of operating and line conditions—by the addition of the

Erico
Portable Welder

If you have a bonding condition that is not now being efficiently cared for by your present equipment, put it up to us, and we will demonstrate to you that one of our three types of bonders will take care of your needs in a way that will please you.

The Electric Railway Improvement Co.
Cleveland

ERICO
THE LINE OF LEAST RESISTANCE

Los Angeles

Thermit Insert Welds

continue to give an uninterrupted rail

In the March 16, 1916, issue of the Electric Railway Journal we quoted an official telegram, March 13, 1916, from the Los Angeles Railway that out of "300 Thermit Insert Welds made in 1913 on P S 116/292 rail; report of October, 1915, reads 'no breaks; no cupping; no pounding; perfect condition.' "

Thermit Insert Welds in course of installation on Main St., between Moneta Ave. and Slauson Ave., Los Angeles.

On April 25, 1917, personal inquiry made at Los Angeles disclosed the fact that

Thermit Insert Welds Have Shown No Breaks to Date

Records like this clearly prove that the Thermit Insert Weld is all that we assert. It is far more economical to pay a little more for first cost than to suffer the annoyance and expense of repairing breaks in service—

Especially as the repair of one bad break means the insertion of a new piece of rail and two joints for one.

Thermit Insert Welds Assure a Truly Continuous Rail

GOLDSCHMIDT THERMIT CO.

120 BROADWAY, N. Y.

329-333 Folsom St., San Francisco **103 Richmond St., W., Toronto, Ont.**
7300 So. Chicago Ave., Chicago

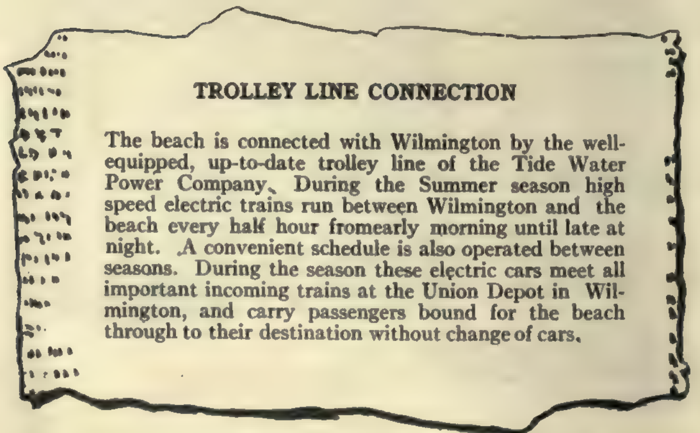
18,000 miles from Miller contact pieces *alone*

The Tide Water Power Co., Wilmington, N. C., began with 6 Miller Trolley Shoes. The Tide Water Power Co. placed an order last March for 42 Miller Trolley Shoes.

The Tide Water Power Co. has 18,000 miles worth of reasons for equipping both its city and interurban cars with Miller Trolley Shoes.

18,000 miles was the life obtained from the contacts alone—and the sides outlast several contacts.

Scores of Electric Railways have made the Miller Trolley Shoe standard because they have found it the one economical solution of their problems in current collection. Write *us* your current collecting troubles now.



TROLLEY LINE CONNECTION

The beach is connected with Wilmington by the well-equipped, up-to-date trolley line of the Tide Water Power Company. During the Summer season high speed electric trains run between Wilmington and the beach every half hour fromearly morning until late at night. A convenient schedule is also operated between seasons. During the season these electric cars meet all important incoming trains at the Union Depot in Wilmington, and carry passengers bound for the beach through to their destination without change of cars.

Miller Trolley Shoe Co.

53 State Street, Boston, Mass.

SALES REPRESENTATIVES

Alfred Connor, Denver, Col.
T. C. White & Co., St. Louis, Mo.
W. M. McClintock, St. Paul, Minn.
A. I. Sanger & Co., Cleveland, Ohio.
Holden & White, Inc., Chicago.
W. F. McKenney, Portland, Oregon.
F. F. Bodler, San Francisco, Cal.
S. I. Wailes, Los Angeles, Cal.

SAFETY FIRST
Type MKB—Dead End, One Hub at Top

SAFETY FIRST SWITCH CONDULETS

Fused, Ironclad and Fool-Proof

MK Series

30 to 200 Amps.

Catalog Sent Free on Request.

CROUSE-HINDS COMPANY
SYRACUSE, N.Y., U.S.A.
NEW YORK BOSTON CHICAGO

Unnecessary Car Spee
Power an

Did you ever stop to think of how much power can be wasted by holding the controller on too long, or by making an unnecessary stop or slow down.

Showing recorder location on one of the cars of the Connecticut Company

It requires *four times* as much power to double the speed of a car as it requires to bring it to the original speed. *Not twice as much but four times* as much.

In other words, there is four times as much power stored up in a car going at 20 m.p.h. as is in a car going at 10 m.p.h., so that an unnecessary slowdown from 20 to 10 m.p.h. will destroy 75% of the power in the car.

That is, if it takes one pound of coal to produce enough energy to get a car up to 10 m.p.h. it will take four pounds of coal to bring that same car up to 20 m.p.h. Under these circumstances an unnecessary slow down from say 20 to 10 m.p.h. wastes 3 pounds of coal.

It is in the higher speed ranges that your power is used up most quickly and that the heaviest demand is made on power supply.

It logically follows that if you can educate car operatives to maintain schedules without making "spurts" at high speed the result will be a very appreciable saving in power.

"The power wasted at the brakeshoes is t

If interested in power-saving, investigate the merits

The Arthur Power-Saving Recorder Co.
New Haven, Conn.

s an Extreme Waste of
s Dangerous

The Arthur Power-Saving Recorder educates motormen not to keep power on too long, encourages them to coast more and so both saves power and increases safety.

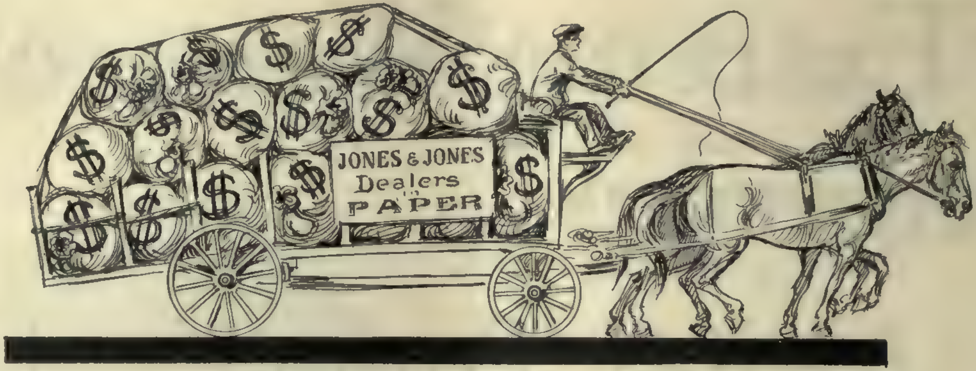
The motorman who is operating a car equipped with this device for recording his efficiency very soon learns that the more power he stores up in a car by keeping the controller on too long or by too high speed the more power he has to take out at the brakeshoes when he is obliged to slow down or stop; and that the more power he has to take out the longer he is forced to keep his brakes on. This longer braking period shows on the Recorder and gives the motorman a poor record when compared with the man who has exercised greater caution.

On the other hand it clearly and indisputably records the good work of the man who uses good judgment in notching up, in coasting and in braking his car—who economizes time and who in general handles his car in an intelligent and economical manner.

rue index of motormen's relative efficiency"

this new Recorder. Its simplicity will appeal to you.

The Arthur Power-Saving Recorder Co.
New Haven, Conn.

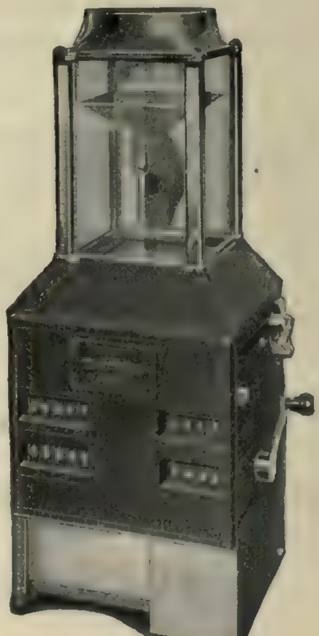


The Johnson Metal Ticket System Stops Waste of Paper

—and, in these days of soaring prices for paper, that's a point deserving your close attention.

But it isn't, by any means, the strong point of the Johnson System.

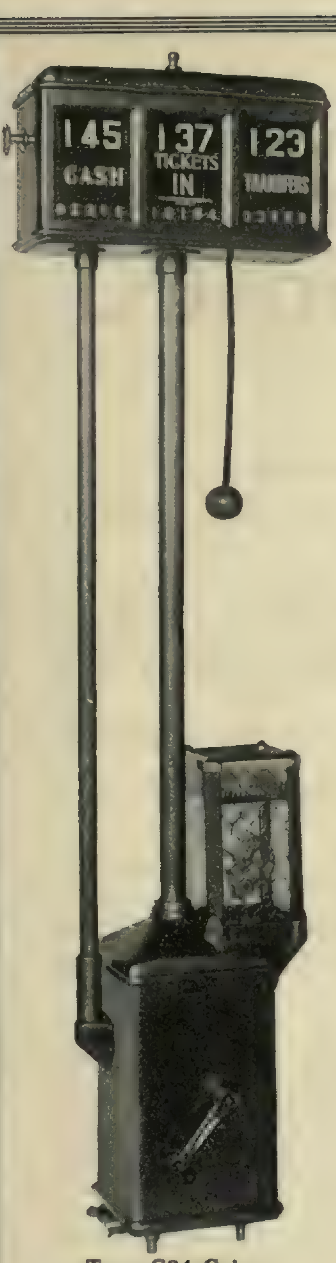
Because here is a system that will handle cash-fares and **metal** tickets; through **one** hopper—a system that makes the metal tickets, or tokens, immediately available for re-sale—that can be made to handle tokens representing two or more different rates of fare—that will accelerate your fare collections at every stop, and thereby materially accelerate your schedules—that will materially increase your earnings—that combines all registering and fare-counting mechanisms in one unit—and that promotes pleasant public relations by making it easy for the public to co-operate with you.



Johnson Fare Box Company

Jackson Boulevard and Robey St., Chicago
50 East 42nd Street, New York

Have You Considered the Use of Metal Tickets?



Type C24 Coin, Metal Ticket and Transfer Register

Type C14 Coin and Metal Ticket Register

The Lincoln Traction Company, Lincoln, Nebr., were pioneers in their use, and for them we designed the International Type C24 Combined Coin, Metal Ticket and Transfer Register, which went into service April 1, 1915, more than two years ago, and have given continuous, thoroughly satisfactory service since, with increased earnings and better maintained schedules. (See description and practices Lincoln machine page 199, Blake & Jackson's "Electric Railway Transportation.")

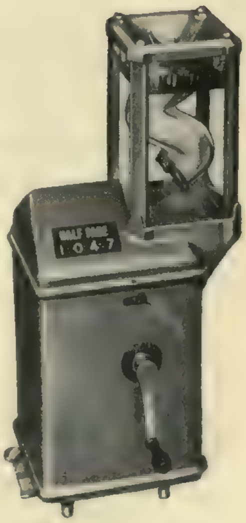
The latest road to adopt metal tickets is The Kansas City Railway Company, Kansas City, Mo., from whom we have just received the largest single order for this type of machine ever placed, covering a complete equipment for their cars with the International Type C17 Coin and Metal Ticket Fare Box to be used in connection with International Type R7 Single Register.

The Milwaukee Electric Railway & Light Company have also placed a small order for the same type of box for use at Racine.

The United Railways Company of St. Louis have in use a large number of standard International Coin Registers and Fare Boxes, and the Sioux City Service Company is entirely equipped with International Fare Boxes, where metal tickets of the size and value of a nickel are used.

We illustrate on this page two types of Coin and Metal Ticket Registers and two views of the Coin and Metal Ticket Fare Box, any one of which can be arranged for motor operation if desired.

Cash Side Type C17 Coin and Metal Ticket Fare Box



Ticket Side Type C17 Coin and Metal Ticket Fare Box

These are only a few of our many fare collection and registering devices. Send us your problems.

THE INTERNATIONAL REGISTER COMPANY

15 South Throop Street

CHICAGO

Practical advice in the shop is trouble saved on the road

That is one of the many benefits secured through our free Expert Service. Read the following partial report from one of our Experts:

"The manager understands of course that if the bearings are in poor condition, even the best oil will not prevent trouble, but he is greatly perturbed by the hot boxes on their interurban cars. I have made *suggestions* to obviate this and bring about permanent betterments to the service, as follows:

"First—The work of rebabbitting journal brasses should be done at the main shop and by one man, so as to place the blame for poor work that is being done.

"Second—That a more liberal supply of new brasses be placed in service, as there are a number of the old ones that must be scrapped.

"Third—That as soon as possible rebabbitting of journal brasses be discontinued and the brass be allowed to wear to a scrapping point and then taken out of service.

"Fourth—On account of the high speed and weight of cars, there should be a more liberal renewal of high grade packing, as a large proportion of the journal packing now in service is short strands, and while it would prove satisfactory in slower service, it is not conducive to good operation under the present conditions.

"Also, I have *requested* them to discontinue a practice which, no doubt, has been the cause of a part of the journal trouble, and if continued it will ruin the journals. I refer to a block of wood that has been made in the form of a journal brass and when they have a hot journal they remove the brass and put in the block of wood with a sheet of emery cloth on its face and then run the car. The result is another hot journal, as it is impossible to remove all the emery from the journal without removing the journal box. Furthermore, any irregularity in the journal face or diameter will be aggravated by such a proceeding and new journal brasses will have so little surface in contact with the journal that the weight per square inch is out of all proportion to what it should be. This was proven by an inspection of journal brasses that had only been in service twenty-four hours. The journal box dust guards have not had the attention they deserve, and there are a number of journals without them."

Little things? Yes. But it was the viewpoint of a practical outside man that discovered them and realized their important effect on good service. That is what our Experts will do for you—point out the little faults, far reaching in their unfavorable effect on your service, that you have lived so close to that they have been unnoticed. And note that our man made only SUGGESTIONS and REQUESTS of the railway officials—no commands, no arbitrary demand that such and such a thing be done—it is up to the officials to accept or reject our recommendations. But the wide-awake railroad man is looking for practical advice. And we are equipped to give it to him.

Galena-Signal Oil Co.

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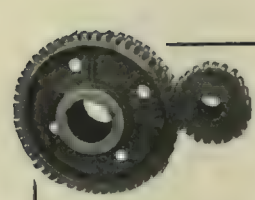

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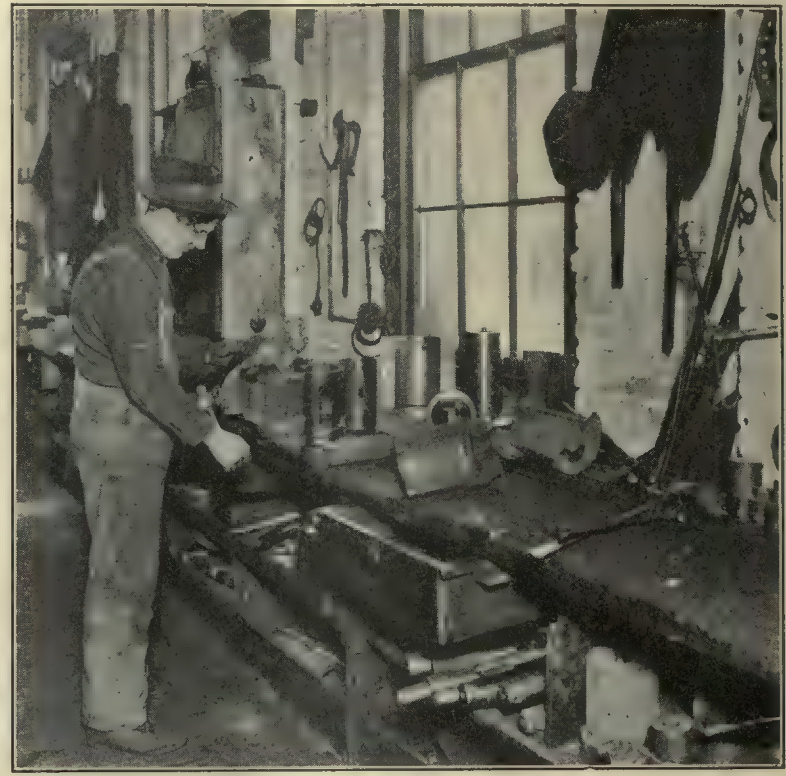
There's a Lot to Making Bearings



There's a lot more to making a good bearing lining than pouring the metal into a mold.

There's the right formula for the service; and the need for seeing that the mixture is made at just the right temperature so the metals will really mingle.

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are made from first to last with quality material and workmanship. They fit G-E motors perfectly and consequently are the easiest to install.

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AIR SUPREMACY CHEAP AT HALF A BILLION

The rapid advance which the airplane has made mechanically within the last two years is ample warrant for the recent proposal at Washington to appropriate $500,000,000 for the immediate construction of an overwhelming number of machines. This is the first move in developing a gigantic American air service. Aeronauts are the eyes of an army and the principal means by which its artillery fire can be efficiently directed. If the Allies can win the mastery of the air by a vast preponderance of airplanes and flyers, not only can they greatly diminish the effectiveness of the enemy's artillery, but they can attack strategic points at a considerable distance in his rear. The construction of an airplane engine differs considerably from that of an automobile, as lightness for the horsepower developed is a prime necessity, and airplane engines must be capable of developing their maximum power continuously over long periods as well as operate successfully at greatly varying altitudes. Nevertheless, with the resources for manufacturing automobile engines possessed by this country, the construction of 50,000 airplanes, which is the number being considered, ought not to be a great task. A number of our readers are gas-engine specialists, and we commend their support to this movement. In fact, we can conceive nothing more important than that the Sheppard-Hulbert bill will pass Congress, and pass at once. It is one of the most practical means for hastening the end of the war that has yet been put forward.

TAKING ADVANTAGE OF ECONOMY KINKS

One of our superintendent-of-rolling-stock readers insists that the mechanical men over the country are losing thousands of dollars a year for their companies because they do not take advantage of the ideas presented in our columns for effecting economies in the maintenance of equipment. He never hesitates, he says, to put into use anyone's kink which will fit his conditions and make for reduced operating costs in the mechanical department. He watches the "Equipment and Its Maintenance" department of the Journal as he would the stock quotations if he had a thousand shares of Bethlehem steel. The fact that someone else conceived an idea does not cause him to hesitate to take advantage of it, for if it will reduce his department costs that will be a feather in his cap sufficiently bright to offset some sacrifice in personal pride because the idea originated with another. This is why we are making every effort to supply the industry with all the kinks which are developed, and any master mechanic who fails to note these carefully and to size them up for application in his own shop is missing a good thing, and is not doing himself justice or giving his best to his company. When opportunities of this sort are laid on a man's desk every week, should he not be alert to his responsibilities in these days of high operating costs and "grab" every economy kink? Many mechanical men do, but some, we fear, fail to see this very practical opportunity.

DISPLACING THE ISOLATED PLANT

The old saying about it being an ill wind that blows no one good appears to be applicable to the present fuel situation, at least as far as some of the railways who sell power are concerned. While the high cost of fuel has been a serious burden to the large consumer it has been an even more serious one to the small consumer. The former, by reason of his greater purchases and better fuel handling and storage facilities, has been able to secure better rates and a larger percentage of his fuel at the old contract prices. Further, as the large consumer ordinarily is better located with respect to transportation systems, he is having less trouble in getting prompt shipments than is the small consumer. Altogether, the way of the small plant during these strenuous days is not a path of roses by any means, and municipalities and other owners of small isolated plants are evincing far more interest in the matter of purchased power than they did in former days. It would seem, therefore, that, for those railway companies which have an assured fuel supply and a schedule of power rates which permits a profit with the present cost of producing energy, now is a most opportune time to build up the power load.

SLACK IN SCHEDULES AND ENERGY INPUT

On another page of this issue there is advanced, in an article by C. H. Koehler, a novel plan for investigating schedules without necessity for any reference to traffic conditions. The basic idea is that, with reasonably satisfactory equipment and operation, the input of energy may be made to measure the "slack" in any schedule by means of a so-called "service-characteristic" diagram. This may appear somewhat formidable because of its inclusion of an interesting paradox to the effect that, when schedules contain no slack, the energy consumption will go down as the speed goes up. The reason for this apparent reversal of the laws of train resistance is plainly that, for city schedules without slack time, the whole of the energy input goes for acceleration, and the only thing that can change the energy input is a change in the number of accelerations (or the number of stops) per mile. Acceptance of this hypothesis leads directly to the important feature of the theory involved, which is that a certain schedule speed for a certain equipment means a certain practical maximum energy consumption, this maximum being at the point where no slack, or spare time for coasting, is provided. No more power can then be used unless the motorman does absurd things with his controller and brake. If less energy than this is found to be consumed in actual service the difference between the two figures serves as a definite measure of the margin (or slack) between the actual and maximum schedule speeds. Therefore, to determine whether a schedule is too high or too low, it is unnecessary to make an exhaustive investigation of the number of stops and their duration. Instead, only a knowledge of the actual energy input per car-mile is required. Thus there is eliminated at one stroke that bugbear of all transportation problems—the indeterminate and highly elusive factor of stops per mile. It will be interesting to see the proposed new method applied in practice to a congested railway system.

SAVING FUEL IS A PATRIOTIC DUTY

In the issue of this paper for June 2 we directed attention to the magnitude of the possible saving in coal which could be made by careful attention to the matter all along the line from coal pile to brakeshoe. Our estimate of the coal consumption in electric railway power plants at about 9,000,000 tons per annum has been confirmed for us by estimates made since the publication of that editorial by the director of the United States Geological Survey, Dr. George O. Smith. Dr. Smith says, "Your figure seems to be as fair as any which could be worked out from statistics now available." The electric railways, which are large producers and still larger consumers of electrical energy, should lead the way in practising all possible economy without prejudice to good service.

The pressing need of the government and the country in general for fuel, combined with the high prices of steam coal, furnish together an extraordinary incentive for economy. Of timely interest, therefore, is the suggestion of Secretary Franklin K. Lane of the Department of the Interior that water power be utilized to the maximum possible extent in electric power plants. While it is probable that, in the interest of ordinary economy, electric railways depending in part upon water power for their energy supply are utilizing this to the maximum extent, there may still be some possibilities of fuel saving in this direction. Co-operation in a given locality, for example, might result in tying together a number of plants normally independent and thus enabling them to utilize more fully the total water power in the combined system.

At the time of the preparation of the latest available census report the capacity of water-power units in electric railway power plants was about 13 per cent of the total, and it was then increasing. The recent rapid development of the steam turbine, however, has reduced the attractiveness of water power, so that we do not look for any great increase in this percentage. We are glad, however, to pass along Secretary Lane's suggestion in the hope that the use of available water power may be to some extent increased at this time, even if this is not the most economical procedure when judged by ordinary engineering standards.

CAR DEPRECIATION

What is the life of an electric car? This question comes to the foreground almost every time the matter of fixed charges on rolling stock is being discussed. And the fixed charges question should come up every time it is proposed either to buy new rolling stock or remodel old. The interest in car life, of course, is due to the fact that of the fixed charges, depreciation constitutes a most important item. The life question also presents itself in property valuations whether they are for rate adjustment, taxation or fixing a fair selling price. The question is complicated by the fact that the different portions of the car equipment do not depreciate at the same rate. It is at present deemed good practice, when the depreciation of rolling stock is being considered, to treat the electrical equipment as separate from the remainder of the car. Our present discussion is limited to this remainder.

The physical life of a car is conditioned by a number of factors, among which may be mentioned type of construction, materials of construction, class and severity of service. The effective life is limited not only by physical deterioration, but also by such other factors as adequacy and obsolescence. As far as actual physical life is concerned, well-maintained rolling stock will last a long while. As noted in our issue for March 3 relative to the Chicago Elevated valuation, the lives, physical presumably, assigned to wooden, composite and steel cars were forty, forty-five and fifty years respectively. The figure for wooden cars would correspond to a straight line depreciation rate of 2.5 per cent since the salvage value of a wooden car is nil. The physical depreciation of steel cars is, of course, less than for wooden ones. But it is not physical deterioration alone that fixes the life of a car. To realize this one has only to pry around a bit in the forgotten and grass-grown nooks of our street railway systems which constitute the "graveyards" of the cars of yesterday. True it is not hard to find twenty-five-year-old cars still doing duty, but an inspection of the cars on our larger urban lines discloses that most of them, to the initiated observer at least, carry the "Built since 1910" sign. Progress in the art of car construction has been so rapid during recent years that the cars formerly operated on these lines have been forced into the remodeling shop, the second-hand market or the "graveyard."

With the above in mind it is interesting to note that the average of eight estimates on car depreciation gleaned at random from utility commission, consulting engineers and operating company reports is 6.8 per cent. This corresponds to a life of approximately fifteen years. As the art of car construction is still far from being in a quiescent state, we wonder if the matters of adequacy and obsolescence are receiving as much weight as they should in estimates of depreciation and rates.

A MESSAGE FROM THE OTHER SIDE

One feature that stands out above all others in several letters and reports which have been received in this office from British sources of highest authority, but which, unfortunately, may not be published as they stand, is the message that we in America must conserve our man-power for military purposes by every possible means. Our ally across the Atlantic has learned this lesson through bitter experience and at a cost that is beyond reckoning. Every British industry, not least among which appears the tramways, has been caught in the maelstrom of reorganization necessitated when whole nations go under arms. Only those who have been through this can realize what it means and what inevitably comes in its wake.

To quote from one of our friends in London, "the great thing for you to bear in mind is that if America organizes an army of millions to make munitions as well as fight in self-defense (or whatever this war may develop into as far as America is concerned) there will be in your country, just as in our country, a great depletion of labor in all industrial circles, including the tramways. Keeping solely to the tramway business and leaving aside all other industries, the one thing that should enter into your calculations is the education of women to fill almost every job now occupied by men. You will have to educate your women first of all to be conductors and then drivers, to be car cleaners and switchboard attendants and operatives of all kinds around the power houses and car sheds. There is practically nothing that men did in the past, in connection with our tramways, that women are not doing now with, perhaps, the single exception of stoking furnaces —and women may even be trained for that before the war is finished. Remember, it takes time to do this, and though you are not suffering from a depletion of men at present, it is possible that you will be in a year's time. If you have no trained women to fill these vacant positions, then the industry must get into trouble. Doubtless the innovation of working women will be opposed as it has been in this country, but you must be prepared for that and must start on a broad campaign of education covering the situation that your country faces. Unless that is done—and done very thoroughly—there will be much obstruction, augmented in your particular case, I have no doubt, by hostile and pacifist elements."

American electric railway companies want to be fully prepared to supply the service which will be needed of them during the war, but the conditions now prevailing are unparalleled in our history. There is nothing in the past of our own country to guide managers in what they should do, because during the Civil War both armies and railways were far smaller than they are in these days. But the message conveyed by the words just quoted is clear enough. Railway companies can well listen to the voice of practical experience from abroad and act promptly upon the advice given.

HIGHER-FARE PROBLEM INHERENTLY SIMPLE

The greater revenue agitation and campaign by the electric railways of the State of New York are gaining momentum under the persistent accelerating force which is being exerted by the committee of ten. One of the things which the campaign is bringing out is the inherent simplicity of the whole proposition, once it is divested of frills and furbelows. If the 5-cent fare was reasonable ten years ago, it should require no argument to prove that it is unreasonable to-day, and this for two reasons. In the first place the service rendered is greater, and in the second place the purchasing power of the nickel is less. That is all there is to it. If the fare could be adjusted in accordance with the law of supply and demand, the railways would have no one to blame but themselves if they could not make ends meet. But as the public controls the situation and, with perfect right, supplants the law of supply and demand with its own sweet will, it is up to the public to be at least as reasonable as that inexorable and ancient law. And it is not a matter of sentiment either. Transportation is a necessity which cannot be had without capital. Now capital is free to obey the law of supply and demand. There is plenty of capital, but it is naturally going where the best combined return and security can be had. Is this in the railway business? Well, no, not under present conditions.

Professor Conway's article this week on the New York situation explains very clearly why this is so. Owing to the neglect of the companies to make a proper depreciation allowance, the present capital is gradually wasting away. Nevertheless, as Professor Conway says, the United States Supreme Court has declared that the maintenance of an adequate depreciation fund is a duty which every public utility owes to its stockholders, its bondholders and to the public. The Public Service Commission of New York, Second District, has adopted a like attitude in at least two cases which have come before it for adjudication, and a similar position has been taken by other commissions. But without adequate income how can a company make this allowance, which the federal court and the state commission declare is part of its obligation to the public?

In Next Week's Issue:

Ivy L. Lee will discuss the necessity
for higher fares on Electric Railways

Several articles on Track Construction and related matters will also appear

Typical Car-Yard Improvements at Rochester, N. Y.

Simplicity, Reasonable Cost, Ample Fire Protection and Complete Utilization of Site Are Features of New Shop and Revised Storage Track Layout at New York State Railways' Portland Avenue Yard

By D. J. GRAHAM
Chief Draftsman Building Department New York State Railways, Rochester, N. Y.

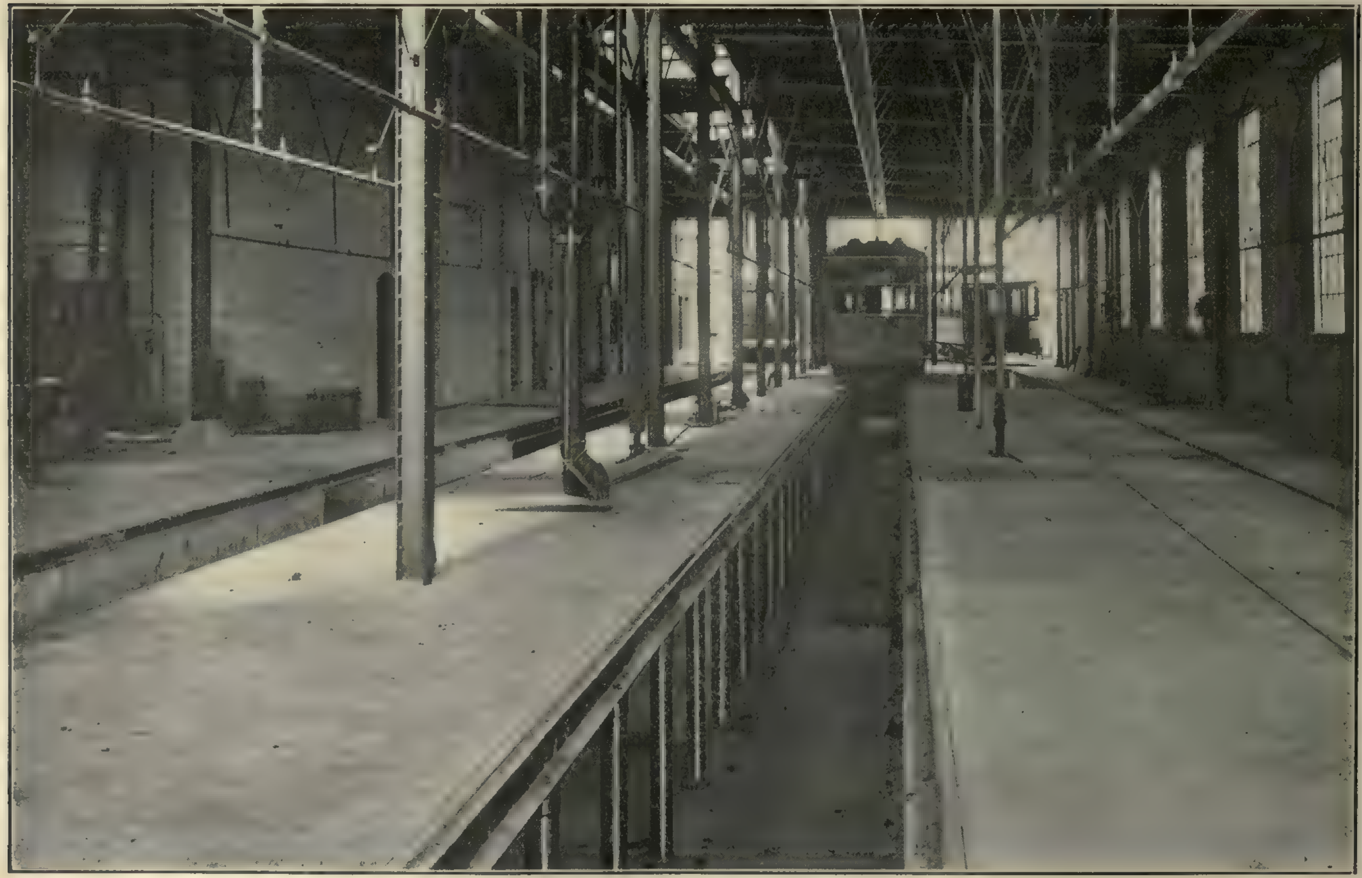
ELECTRIC railways generally are giving a great deal of attention to the layout of yards and shops to facilitate handling of cars into and out of storage, periodical inspection and light repairs. An illustration of this fact was given in the article on car-yard layout in Detroit published in the issue of the Electric Railway Journal for March 24, 1917. In Rochester we have just completed a part of the contemplated improvements at the Portland Avenue yard. These include a new building for car washing, inspection and ordinary repairs, the addition of more tracks in the yard, and the enlargement and rearrangement of the yard sprinkler system more completely to protect the cars stored in the yard. Typical drawings and photographs have been selected to indicate the details of the improvements. The general layout plan shows also, in broken lines, the outline of a future administration building. The front of this along Draper Street will be of tapestry brick and from the architectural standpoint it will round out the general scheme.

The general layout is designed to minimize the movement of the cars as they are operated through the yard, and the general plan for doing this can be seen in the layout drawing on page 1084. Pull-in cars come into the yard from Portland Avenue and distribute to the several tracks as they are assigned by the car placer. Pull-out cars pull onto the ladder tracks parallel with Concord Street, taking curves either east or west on Draper Street.

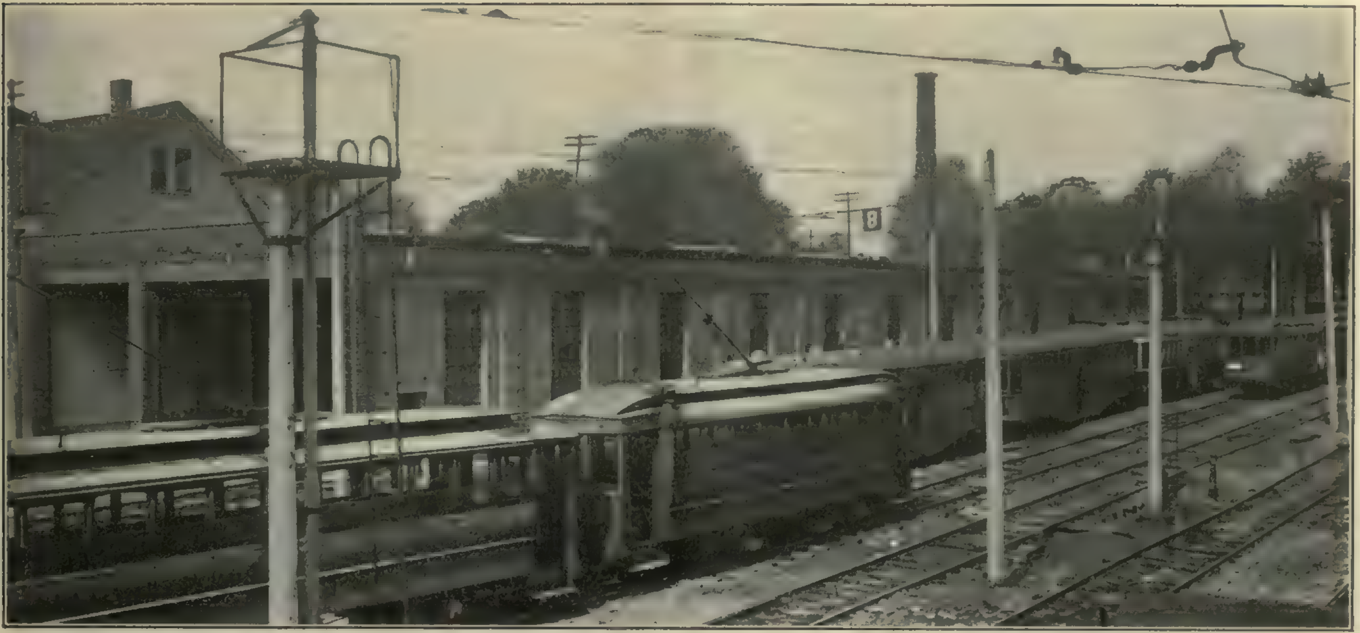
The new repair shop is so located in the layout that there is no interference between yard operation and car repairs. Cars pulling in from the road for repairs take the tracks off Portland Avenue, pulling onto track No. 3 over the inspection pit located at the west end of the shop. After inspection, cars are placed over the pit on track No. 2 for wheel, truck and axle repairs or changes, or over the pit on track No. 1 for motor repairs or changes. The shop accommodates twelve cars over repair pits and wash track.

Sprinkler Nozzles Command Entire Yard Area

The most prominent feature of the yard is the group of monitor nozzles supported on reinforced concrete



ROCHESTER CAR-YARD IMPROVEMENTS—INTERIOR VIEW IN NEW SHOP, SHOWING PIT AND GENERAL BUILDING CONSTRUCTION, AND SPRINKLER SYSTEM



ROCHESTER CAR-YARD IMPROVEMENTS—VIEW IN YARD WITH MONITOR NOZZLE SPRINKLER POLE IN FOREGROUND

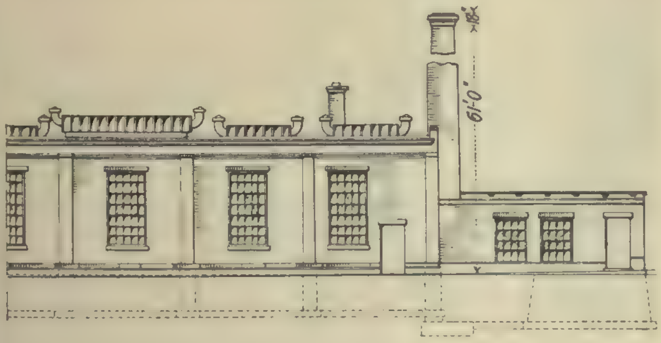
poles 27 ft. long. These are set in concrete foundations 7 ft. deep. These nozzles have 1⅛-in. apertures and of them five were installed in the new part of the yard and three on the north end of the old yard during the present improvements. The complete piping system is shown on the general layout drawing, where the diameters of principal pipes and locations of nozzles and valves are shown. The photograph above shows clearly the nozzle and supporting structure.

Readers who are familiar with the old Portland Avenue yard will note from the drawing that considerable additional property adjacent to it had to be acquired. From this thirteen frame dwelling houses had to be removed, as well as 6570 cu. yd. of sandy loam in connection with the grading.

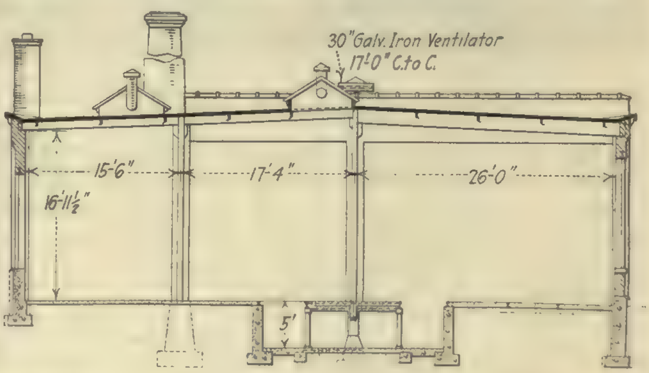
EXCELLENT LIGHTING IS CONSPICUOUS IN THE SHOP

Supplementing the information regarding the shop which can be gathered from the drawings and photographs, attention is directed to the liberal supply of light throughout the shop. Skylights are distributed liberally over the roof. These are of the David Lupton type with rolled steel bars, copper caps and curb aprons of 16-oz. copper. Numerous windows, with Kawneer factory type steel sash, are also provided in the side walls.

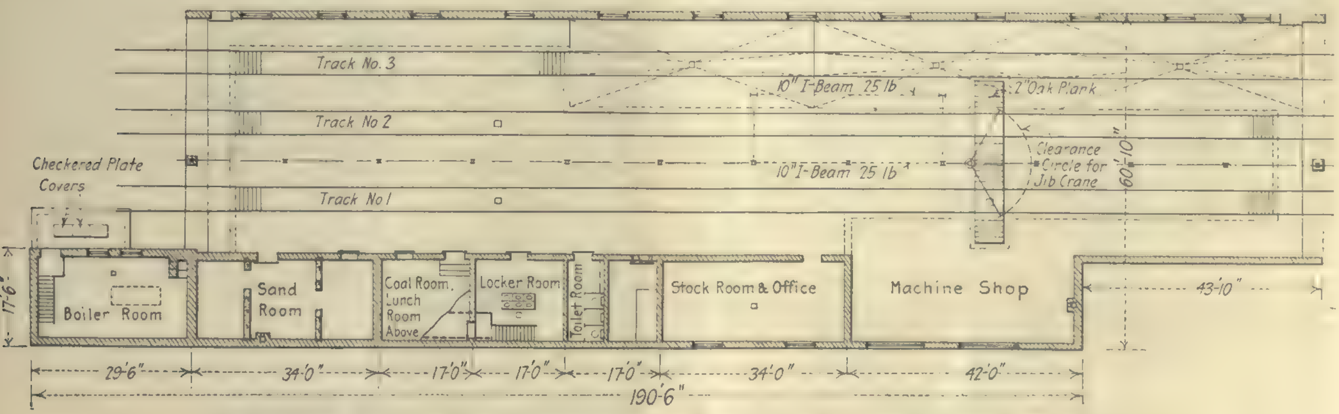
All foundation walls, footings, piers, pit walls and re-



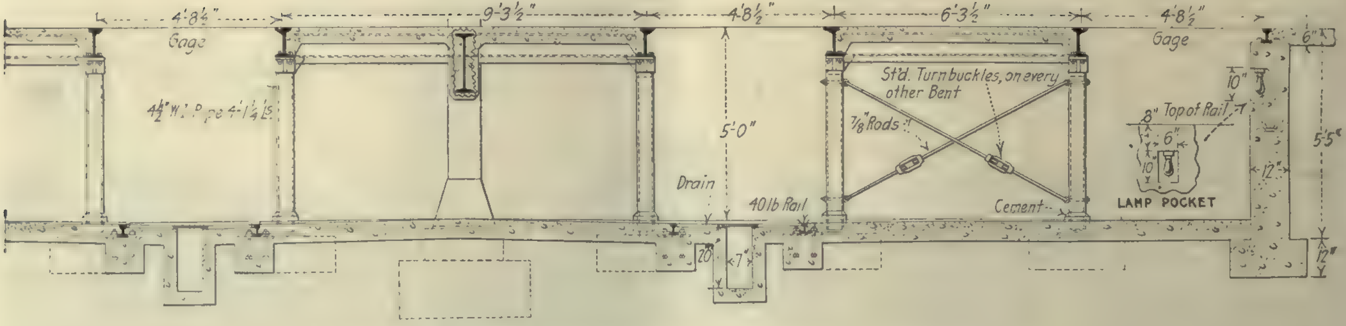
ROCHESTER CAR-YARD IMPROVEMENTS—PARTIAL SIDE ELEVATION OF SHOP



ROCHESTER CAR-YARD IMPROVEMENTS—CROSS-SECTION OF SHOP BUILDING, SHOWING GENERAL STRUCTURAL FEATURES



ROCHESTER CAR-YARD IMPROVEMENTS—FLOOR PLAN OF PORTLAND AVENUE SHOP



ROCHESTER CAR-YARD IMPROVEMENTS—CROSS-SECTION THROUGH PITS

taining walls are of 1:2:5 gravel concrete, which was poured in forms in 12-in. layers and thoroughly puddled. The exterior walls are of selected hard-burned common red brick except on the street side where tapestry brick facing was used. The interior walls are of sand-lime brick. All brick was laid in sand, lime and cement mortar with ⅜-in. struck joints for common and sand-lime brick, and ⅜-in. raked joints for tapestry brick.

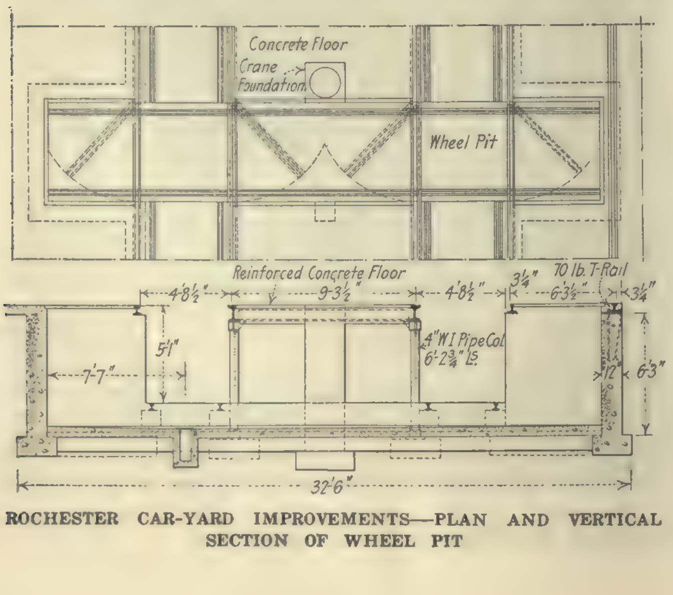
The roof framing is of steel I-beams and channel purlins, the beams being supported on channel and plate columns in the center and pilasters in the wall. Over the steel are 1¾-in. Georgia pine matched roofers, spiked to nailing strips bolted to the channel purlins. Over the wood is a five-ply felt and slag covering, the felt being mopped together with coal-tar pitch and the slag imbedded in this while hot.

ROCHESTER CAR-YARD IMPROVEMENTS—CONSTRUCTION VIEW, SHOWING PIT COLUMNS AND FLOOR BEAMS

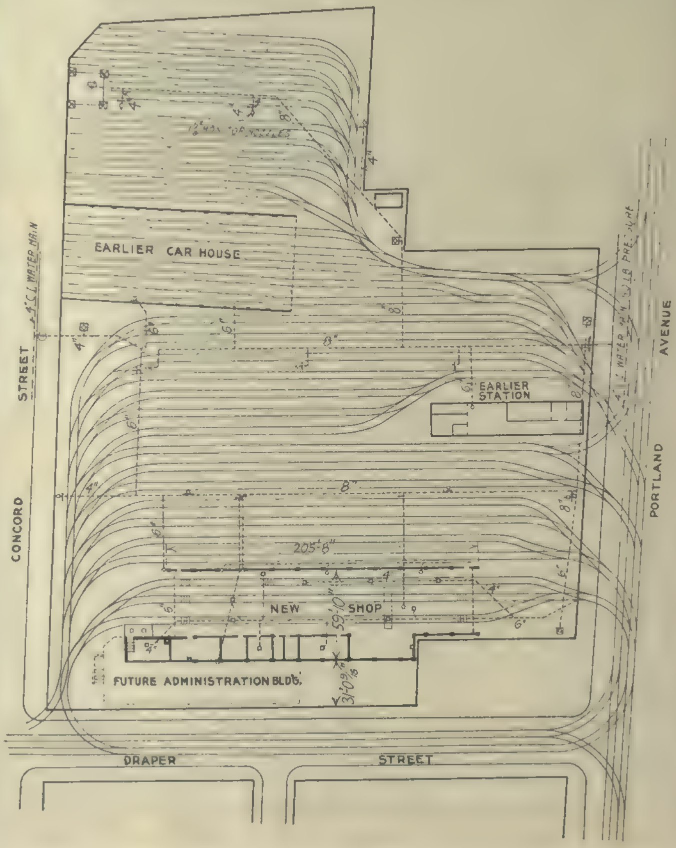
In the reinforced-concrete floors ½-in. reinforcing bars, spaced 5½ in. center to center, were placed in 1:2:4 crushed stone concrete. The surface of all floors was hardened with Trus-Con floor hardener, placed on the surface coat of 1:2 sharp sand and cement. Toncan metal was used in roof saddles, cornice and gutters. Steel rolling doors are located at the east and west ends of the shop. They are of the Kinnear type with chain operators. The shop is liberally provided with sprinkler heads, of which there are 126 on the aisle lines and 234 on the roof lines. The equipment is of the Grinnell type and it was installed by the General Fire Extinguisher Company. Two 6-in. straight-away dry pipe valves control the roof and aisle sprinklers.

For heating purposes the vacuum system is used in this carhouse. The steam is supplied from a nine-section No. 34 Mills boiler at 2 lb. per square inch steam pressure, while an automatic electrically-driven pump is used to maintain a vacuum of about 10 in. An equipment of this kind permits adjustment of the temperature of the steam so that fuel can be economized in moderate weather.

The arrangement of small rooms along the side of the building presents few novel features, but the pro-



ROCHESTER CAR-YARD IMPROVEMENTS—PLAN AND VERTICAL SECTION OF WHEEL PIT



ROCHESTER CAR-YARD IMPROVEMENTS—GENERAL LAYOUT OF PORTLAND AVENUE YARD vision of a lunchroom for the men is one which we think will be greatly appreciated.

FACILITIES FOR MAKING REPAIRS

Over the pits the reinforced-concrete floor is supported on 6-in. pipe standards set in iron sockets. These pipe columns are cross-braced to give the floor the necessary rigidity. The pits are lighted by means of lamps located in pockets in the side walls.

Opposite the machine shop is a wheel pit equipped with swing rails for the removal of wheels. By means of a transfer table and a wheel jack carriage very rapid wheel changes can be made. A gib crane is mounted close to the wheel pit for use in handling parts to and from the machine shop, and chain hoists are also installed for use in lifting cars off the trucks.

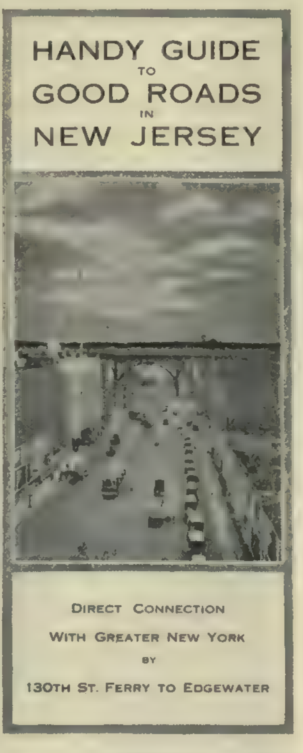
The tool outfit in the machine shop comprises only those tools which are necessary for light repairs. It comprises a lathe, a drill press, a forge, a grinder and sundry smaller tools.

The cost of the new shop was $35,840, excluding track work and electrical work installed by the company. In addition the sprinkler system cost $6,630 for the monitor nozzles and underground pipe work, and $3,420 for the shop sprinklers. About five and one-half months were required for the whole job. The plans for this building were prepared by G. M. Cameron, engineer in charge of buildings and new equipment, and the track changes were carried out in accordance with plans made by D. P. Falconer, engineer maintenance of way. The contract for the shop construction was let to a local contractor.

Selling "Public Service" to a Whole State

The Methods and Means by Which New Jerseyites Have Been Led to Become Acquainted with the Manifold Activities of the Great Utility in That State

"JOINING Jersey's busy cities and thriving towns to nature's heart 'mid vales and wooded hills," run the tracks of the Public Service Corporation of New Jersey. For such a system—big in size and in the number and the variety of affiliated utility services—the problem of establishing better public relations is practically of Statewide importance. Yet such work in this case is mainly characterized by its simplicity, for the company just tells the public what it is doing. How this policy has been developed and carried out is a story that should interest the industry.



HANDY GUIDE TO GOOD ROADS IN NEW JERSEY

DIRECT CONNECTION WITH GREATER NEW YORK BY 130TH ST. FERRY TO EDGEWATER

P. S. C. PUBLICITY — ROAD GUIDE ISSUED TO 15,000 NEW YORK CITY MOTORISTS

WHY THE WORK WAS FIRST STARTED

During the first few years after the Public Service Corporation was formed in 1903, the officials were busy with the rebuilding and the rehabilitation of the various consolidated properties. Then they had no time to talk, but by 1909 the feeling had grown up that the public ought to know what had been accomplished. It was not a question of answering public criticism or correcting public misinformation, but merely of providing a means whereby the public might become fully acquainted with every phase of the corporation's work.

With such an end in mind, the company in 1909 took J. L. O'Toole from the city editor's desk of the Newark *Evening News* and made him the mouthpiece for all company activities. At first his title was "publicity agent" (recently it was changed to "assistant to the president"). At the beginning President Thomas N. McCarter issued a general notice to the heads of departments that all talking to the public was to be done by Mr. O'Toole. This did not apply to the president and the vice-presidents, but even in their cases an effort was to be made to have their statements go through the publicity department, in order that all information might seem to emanate from one source. In order that Mr. O'Toole might have first-hand information on important matters, he was made a member of the executive committee of the three operating subsidiaries—railway, gas and electric.

PREPARING REAL NEWSPAPER COPY

Mr. O'Toole knew from his editorial experience that writing quires of paper for the newspapers would not secure publicity worth anything. The mortality rate on newspaper copy is very high, especially on material written only to serve the purposes of the author. So Mr. O'Toole from the very first laid down the policy of turning in only such stories as he himself as city editor would have sent for if he had known they were available.

For example, the publicity department has sent out stories concerning the awarding of contracts for construction material and machinery; the formulation of welfare plans for employees; the monthly and the annual earnings of the company; definite action taken at directors' monthly meetings; extensions; service additions; rerouting and changes in headway, etc. Each story is based on an accomplishment, not a promise; on a fact, not a rumor or prediction. The telling is matter-of-fact, and no exaggeration is used to play up ordinary affairs.

HANDLING THE NEWSPAPERS

From the beginning, Mr. O'Toole has tried to make the 115 newspapers in the company's territory feel that he is practically a staff member subject to call. His office in Newark is covered daily by the local papers, and he gets in touch with the outside papers by mail or wire.

In sending out stories, the character and the location of the newspapers are considered. Weekly papers receive shorter versions than those sent to dailies, and the same general story for papers in different parts of the State is handled in each case so as to emphasize local conditions. In all cases overwriting is shunned, for it is felt that this is a sure way of wearing out the company's welcome.

In addition to the information that is volunteered to the newspapers, the publicity department of course furnishes much material upon request. The company endeavors to make quick replies to newspaper queries. To this end the publicity department receives a daily "flash" of car delays, detailed reports of serious accidents (head-on collisions, etc.), notices of schedule changes and copies of all operating bulletins issued by the general superintendent or general manager. The department is in possession of much general information on account of Mr. O'Toole's membership on the executive committee, and any specific information along technical and other lines can, if subject to release, readily be secured from the department concerned.

Public Service
Railway

SKIP-STOP
—CAR—
OPERATION

Bloomfield Line

—

EFFECTIVE APRIL 10, 1916

P. S. C. PUBLICITY—SPECIMEN OF CAR PAMPHLET ISSUED OCCASIONALLY; SOUVENIR POST CARD SHOWING NEW NEWARK TERMINAL

A special class of article now and then furnished to the papers—and one of considerable importance—is the long news story for the magazine section of the Sunday issues. The publicity department is glad to supply the necessary information, including photographs, maps or drawings. Along this line articles have been supplied, with illustrations, on such topics as "Building Cars in Newark Shops," "Accident Poster Series," "Training Schools for Car Crews" and "The P. S. C. Private Telephone System—Largest in the World in Miles of Wire."

When a newspaper is flagrantly wrong or unjust in its statements, the publicity department sends to it a courteous letter setting forth the facts. The purpose is not to start a controversy but to put the editor in possession of correct information so as to prevent if possible a repetition of the offense. It is rare that such a letter does not receive acknowledgment in the form of a letter or else in the guise of subsequent items worded correctly.

How Newspaper Ads Are Used

The company from the beginning has realized that newspaper editors have a right to exercise their judgment as to what should be printed as news, and that they are justified in editing all news copy so as to make it conform to their style. When the company, therefore, wishes to say something in exactly its own way, it does not try to restrict the freedom of the editors but buys advertising space. In this way criticism is prevented except on the part of those carping fanatics who deny to corporations the right of presenting their case in any manner.

During the first six months after the publicity work was begun in 1909, the company carried on a campaign to show what had been accomplished in the preceding years of regeneration. Since then, with the exception of regular commercial advertisements to aid the marketing of gas and electric appliances and of several short campaigns against municipal ownership, the company has done no organized advertising, but has raised its official voice only from time to time as necessity demanded.

For example, last November, in answer to the malicious charges of campaign speakers about a corrupt company lobby at Trenton, President McCarter wrote a straightforward advertisement stating that the corporation, like any ordinary citizen, had the right to send its representatives to the Capitol in the light of day to express support of or opposition to proposed legislation. Moreover, in January the company told the public how service had been greatly increased in 1916 without any increase in price, but asked them to ponder what must happen if operating costs and taxes continued to mount. Such official messages are infrequent; but when they do appear they are explicit, straightforward and forcible—therefore they are doubly effective.

Using Other Publicity Media

Besides working through the newspapers, the company uses other publicity means to reach men of certain classes and patrons on particular lines, or to present a story in greater detail than would the newspapers. It has, for instance, developed a line of communication with the business and the professional men of the various communities through the readiness of the publicity representative to make speeches before chambers of commerce, boards of trade, improvement associations, men's club in churches, etc. Periodic meetings of these bodies, or special meetings called to discuss extensions or other transportation questions, afford Mr. O'Toole an opportunity to present interesting facts about the company. On special occasions President McCarter accepts invitations to address public gatherings.

Publicity is also secured through the use of car pamphlets, cards and posters. The pamphlets are used only occasionally to explain, more fully than would a news story, an operating change or proposal, such as the suggested adoption of the skip stop on a particular line in April, 1916, and a general rerouting put into effect about that time. In such cases the pamphlets, it is thought, cause a wider public understanding of the points involved. One of the pamphlets mentioned (2⅞ x 4¾ in.) is shown in the accompanying illustration.

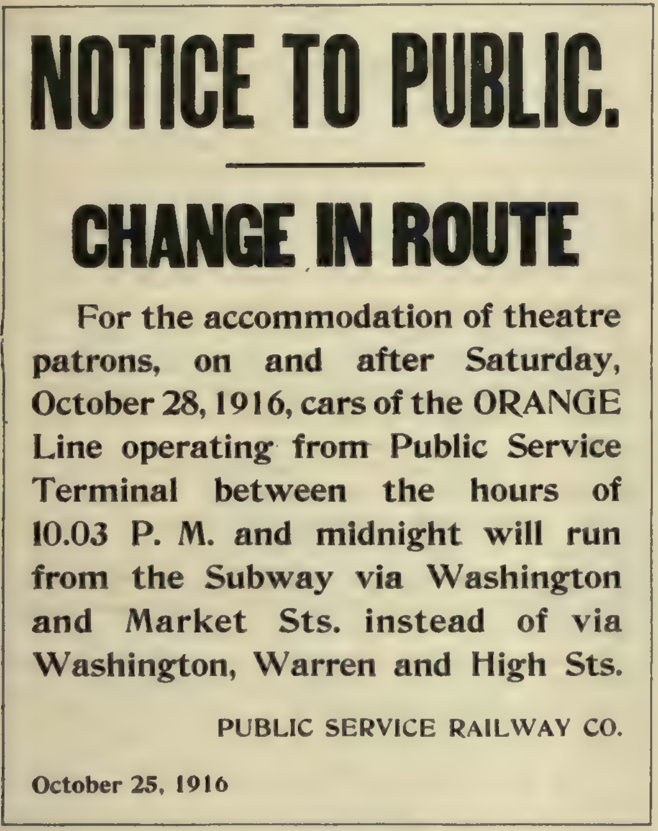
PUBLIC SERVICE LINES NORTHERN SECTION
JOINING JERSEYS BUSY CITIES AND THRIVING TOWNS
PUBLIC SERVICE LINES
TO NATURES HEART MID JERSEY VALES AND WOODED HILLS
PUBLIC SERVICE RAILWAY SOUTHERN SECTION
TROLLEY TRIPS SAFE QUICK AND COMFORTABLE

P. S. C. PUBLICITY—FOLDERS DESCRIBING THE COMPANY'S TERRITORY AND SERVICE

The advertising space in the cars is not controlled by the company, but it is now buying back some of the space mostly for advertising gas and electric appliances, this work being handled through the publicity department.

Though such space is available for other advertising of importance, car cards have been used as a rule only for safety work and then in a special rack suspended from the center of the car roof near the front. In this way the company used a series of twelve lithographed cards showing different types of accidents, and it is now running a series of twelve black and white admonitory messages. The safety work of the company is all handled by a special department, but the publicity bureau co-operates and writes or edits the safety advertisements.

Car cards were used in the advertising space to call attention to the opening of the fast Trenton line, but in general announcements of reroutings, excursions and other operating matters are made by posters pasted on the car windows. Judgment has been used in issuing such posters. As a result, when the car rider catches a glimpse of one, he knows that the company has an important message for him, undoubtedly with some such beneficial end in view as that evidenced by the accompanying specimen poster.



NOTICE TO PUBLIC.

CHANGE IN ROUTE

For the accommodation of theatre patrons, on and after Saturday, October 28, 1916, cars of the ORANGE Line operating from Public Service Terminal between the hours of 10.03 P. M. and midnight will run from the Subway via Washington and Market Sts. instead of via Washington, Warren and High Sts.

PUBLIC SERVICE RAILWAY CO.

October 25, 1916

P. S. C. PUBLICITY—SAMPLE CAR POSTER CONTAINING NOTICE OF REROUTING

The illustrations on pages 1085-6 show additional miscellaneous aids in publicity. Besides the usual pamphlet time-tables for its high-speed lines and lines having not less than a fifteen-minute headway, the company places in stations and commercial offices finely printed and illustrated booklets describing its system and the historic and otherwise interesting points reached. These booklets include a general one for the whole system, and separate ones for the northern and southern sections. It is stated in the newspapers that these can be secured upon request.

When the company not long ago opened its magnificent new terminal in Newark, it secured extra publicity without cost by giving a post card company the right to use the picture, as shown on the preceding page.

To help the motorist who dreads running through the congested streets of downtown New York to reach New Jersey by the lower ferries, the company prepared a handy guide showing the connection of its 130th Street ferry with good roads west of the Hudson. This guide, the front cover of which appears on page 1085, was mailed to a selected list of 15,000 motorists in upper New York City. It was greeted as a commendable sign of corporate consideration for the public.

COMPLAINTS AND CLIPPINGS

All complaints sent to the company are acknowledged at once by the publicity department. The operating official concerned is then asked for a report, and upon the receipt of this the complainant is advised of the disposition of the case. No form letters are used. A card index of correspondents is kept in the publicity office, and the letters are filed in groups of ten, the groups being numbered consecutively.

Besides a stenographer and also an assistant, who handles the publication of two company magazines devoted entirely to employee matters, there is in the publicity department a newspaper clipper. The company subscribes to all the papers in its territory, and all items relating to its activities are clipped and routed through the proper channels to the officials interested. In this way the company secures much information about local conditions and many tips about public sentiment in general.

POLICY HAS BEEN REWARDED

In carrying out its policy of letting the people know, the company has never issued a statement that would depreciate in any way later. As a result, after the first skepticism wore off, the newspapers have shown a tendency to accept the company's news as true. The papers get what they want, if such is at all possible, and they appreciate the company's co-operation.

Through the news stories in the press, and through such other means as the company, out of respect for newspaper practices and the dictates of efficiency, utilizes by itself, the inhabitants of New Jersey have been brought to a greater realization of what "Public Service" is doing for the State. Giving service and talking about it—that is the Jersey company's code—and it pleases the public.

High Cost of Railroad Material

Railroad officials are viewing with alarm the ever-increasing cost of material and equipment. To keep pace with the tremendous demand of the nation in this crisis the railroads must increase their facilities immediately, and they are doing it. Just what it is costing the railroads to live is shown by figures given out by R. J. Clancy of the Southern Pacific Company, who finds that in two years costs in some cases have advanced as much as 488 per cent. A few of the increases in cost follow: Locomotives, 75 per cent; passenger cars, 50 per cent; freight cars, 60 to 80 per cent; spikes, 130 per cent; boiler steel, 301 per cent; white lead, 353 per cent; manganese, 488 per cent; nails, 103 per cent; rivets, 200 per cent; boiler flues, 169 per cent; couplers, 112 per cent; cast-iron pipe, 173 per cent; axles, 227 per cent; steel tires, 133 per cent; bolts, 120 per cent; firebox steel, 231 per cent; journal bearings, 121 per cent; and bar brass, 165 per cent.

According to a statement which was recently issued by the National Coal Board, Council of National Defense, daylight saving reduced coal consumption in England by 300,000 tons in a single year.

Determining the "Slack" in a Schedule

The Author Offers a Novel "Service-Characteristic" Diagram as a Means of Showing at a Glance the Character of the Performance of Any Given Class of Car Equipment Regardless of Variations in Operating Conditions

By C. H. KOEHLER
Sangamo Electric Company

ALTHOUGH the motor equipment for rolling stock is generally designed for some one particular class of service, the cars are operated, in practice, almost always under widely varying conditions. On any city system, for example, a totally different character of service may be required for each of the different lines, but the same type of car may be used on all of them. Even on any one line the density of traffic may decrease or increase materially from month to month, or from hour to hour throughout the day.

During the rush hours 50 per cent more stops per mile may be made than during the off-peak hours, although no corresponding change can be made in the motors on the cars nor in the gear ratio. Consequently, if the equipment is to be adapted even approximately to the varying conditions, it is necessary to vary schedule speed. If a schedule is arbitrarily fixed, and calls for a higher speed than the motors can provide, operation will become disorganized. If the schedule is set low enough to take care of the most severe conditions, a serious, although avoidable loss will occur when operating conditions are relatively easy. In general, the setting of schedules by individual test runs is made difficult by the numerous changeable factors involved, which require the taking of averages of many results for accurate work. However, a simple means exists for definitely determining the amount of "slack" in any schedule regardless of the traffic density, and it is with the idea of calling attention to this fact that this article is written.

THE "SERVICE-CHARACTERISTIC" DIAGRAM

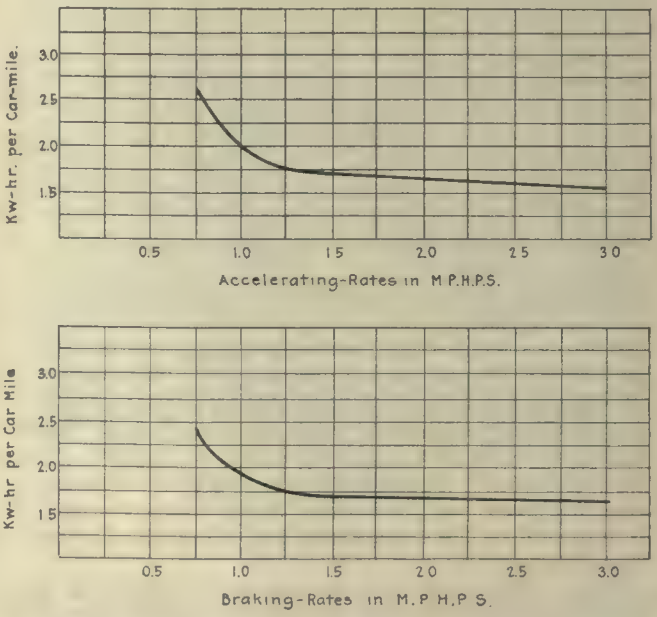
With a given equipment, a given line voltage and given gradients and curvatures, together with reasonably efficient operation, the maximum possible schedule speed on any line is established directly by the length of and number of stops per mile. When the two latter factors have fixed values the maximum schedule speed of the given equipment is definitely limited, and nothing can be done to increase the speed beyond this point. No more power can be absorbed by the motors, and in consequence, the energy input is also fixed. Grossly inefficient acceleration or braking will, of course, increase the energy consumption, but since it is safe to assume that 1.25 m.p.h.p.s. is the minimum rate that could be used by reasonably well-trained motormen with modern equipment, and since the decrease in energy consumption effected by higher rates than this is negligible, as shown in Fig. 1, it may be said safely that both the energy consumption and the maximum schedule speed are established by the length and number of stops per mile.

There is, therefore, a relation between energy input and maximum possible schedule speed for any given equipment, the two quantities varying inversely as the dominating factor of stops per mile changes in value. Only by decreasing the number of or length of the stops can the maximum possible schedule speed be increased, and when this is done the less frequent accelerations produce a corresponding decrease in energy consumption.

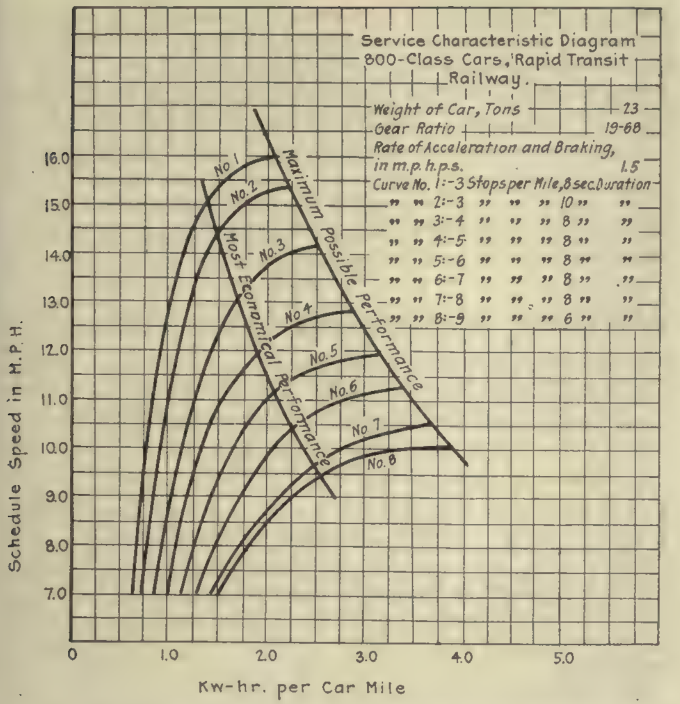
The foregoing paragraphs have considered only the maximum schedule speeds that may be obtained with the given equipment. However, the best service is not rendered with an average schedule speed that too closely approaches the maximum speed possible under the given operating conditions. Rather, the best service is represented by an average schedule speed that is slightly less than the possible maximum, thus providing a reserve or "slack." With this reserve there is afforded sufficient time for making up usual every-day delays so that the cars can hold steadily to schedule time except under extraordinary circumstances. A certain amount of "slack" is desirable and is commonly provided in every schedule, although of course the amount should be minimized.

For any given schedule speed, the use of this slack directly affects the energy input at the car. Thus, energy consumption increases as the slack is used in making up lost time or rendering heavier service. Similarly, the energy consumption decreases as easier operating conditions enable the operator to use slack time in coasting.

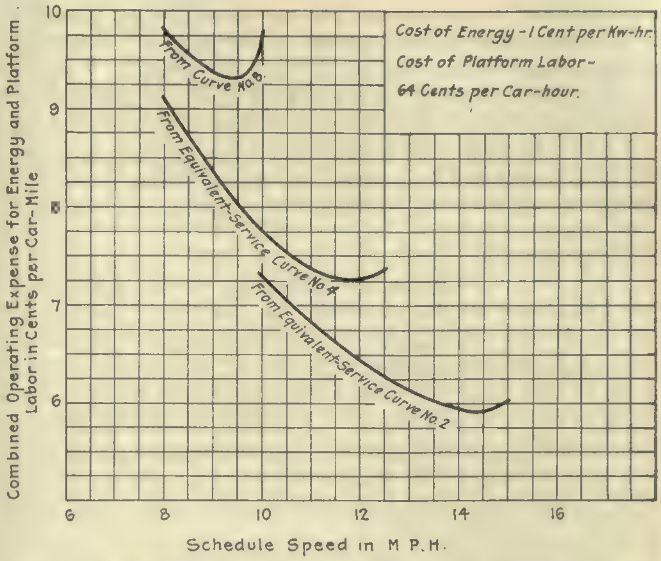
From the foregoing consideration it appears that data on energy input and schedule speed might be plotted in some manner to indicate readily the actual slack and its use, when operating with a given equipment in various services. Such a graph, or "service-characteristic" diagram, as it might well be called, is shown in Fig. 2. The numbered curves making up this diagram are easily derived from data on the calculated energy consumption



SLACK IN SCHEDULES—FIG. 1—DIAGRAM SHOWING NEGLIGIBLE EFFECT ON ENERGY CONSUMPTION OF CHANGES IN ACCELERATING AND BRAKING RATES ABOVE 1.25 M.P.H.P.S.



SLACK IN SCHEDULES—FIG. 2—SERVICE-CHARACTERISTIC DIAGRAM SHOWING PERFORMANCE CURVES AND EIGHT EQUIVALENT-SERVICE CURVES FROM WHICH THEY ARE DERIVED



SLACK IN SCHEDULES—FIG. 3— GRAPHICAL METHOD OF DETERMINING MINIMUM VALUE FOR SUM OF ENERGY COST AND PLATFORM COST FOR THREE OF THE EQUIVALENT SERVICES SHOWN IN FIG. 2

and schedule speeds of a given car making stops of various lengths and frequencies per mile. These curves lose their identity in combination and may be referred to merely as equivalent-service curves. The area included by the outermost curves represents values for all combinations of number and length of stops with the given equipment, or for every possible kind of service demand on the equipment.

All of the equivalent-service curves have the same characteristics and do not cross each other. The same curve will represent different combinations of number and length of stops per mile, but as any such series of combinations represents the same "equivalent-service" demand on the equipment, it becomes possible to neglect altogether consideration of the relative weight of the factors, number and length of stops, if the area covered by the diagram is considered rather than individual curves.

The point of tangency with the horizontal for each "equivalent-service" curve represents the maximum possible schedule speed that can be made, when rendering that particular equivalent service, together with the corresponding energy input. Connecting the points of tangency with the horizontal for the various "equivalent-service" curves produces the curve marked "Maximum Possible Performance."

This curve really defines the limit of operation with the given equipment under various conditions. Points beyond this line, or outside of the diagram, represent impossible schedule speeds for the co-ordinate energy input, with the equipment for which the diagram was developed.

By determining the various values of the two major items in the direct cost of operation (platform expense per mile plus cost of energy per car-mile) at several schedule speeds for one of the "equivalent-service" curves, a series of approximations of the direct cost of transportation may be obtained and the minimum cost ascertained. By plotting such results graphically, as shown in Fig. 3, the most economical schedule speed for this particular service can be readily determined. Repeating this procedure for several of the "equivalent-service" curves gives sufficient points with which to locate the curve "Most Economical Performance," as shown in Fig. 2. This curves locates approximately the most economical schedule speed for every possible kind of service that can be rendered with the given equipment. It also defines the limits for the amount of slack on the schedule that is necessary for good service.

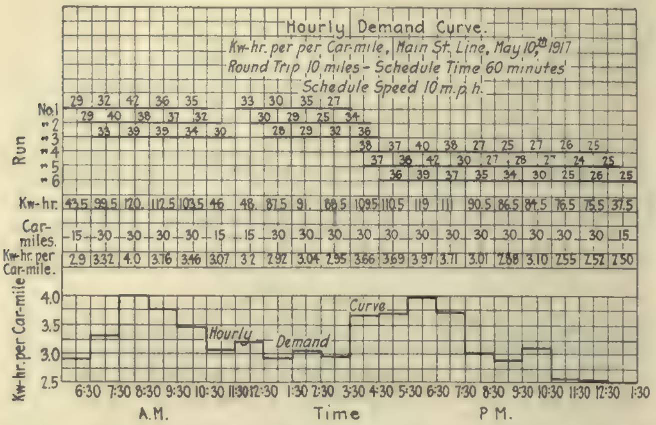
The curve "Maximum Possible Performance" defines the line of zero slack, or schedules that have not any reserve time with which to make up ordinary delays. To the left of this curve the slack gradually increases, till at the curve "Most Economical Performance" it approximates a condition of maximum efficiency. Beyond the curve of most economical performance the slack increases in a proportion that is greater than necessary for good service, and this waste of time means largely increased total operating expense, even though small amounts of power may be saved.

USE OF "SERVICE-CHARACTERISTIC" DIAGRAM

Summing up, it would appear that this diagram might be valuable for analyzing traffic conditions, were it possible to determine the particular service conditions. To this end one co-ordinate—schedule speed—is always obtainable. The number and length of stops varies through wide limits even on a single run, and this factor is difficult to obtain. However, the kilowatt-hours per car-mile may be very easily determined by meter readings. This value of energy input, together with the known value for schedule speed, definitely locates a point on some one of the "equivalent-service" curves. In other words, for a given schedule and any particular set of operating conditions a given equipment consumes a fixed amount of energy if there is no slack. If slack is present the energy consumption will be proportionately less and the difference between the maximum and actual figures for energy consumption serves as a measure of the slack.

By means of meters installed on the cars and read every trip, the exact number of kilowatt-hours per car-mile for any hour of the day may be obtained, and when this figure is used in conjunction with the schedule speed, the exact "equivalent-service" demand may be read directly from the diagram. Thus the slack is definitely determined without calculating or even estimating the number of or length of stops per mile!

To put the data obtained from wattmeters, which are in the form of trip readings in kilowatt-hours, into shape for the proper analysis, it is advisable to determine in hourly increments the average service demand of all cars on the line under investigation. Such an hourly demand for a selected case is shown in Fig. 4. In this the different runs are plotted in horizontal graphs, and the kilowatt-hours per trip are recorded on each section that represents one trip on the graphs. The hourly demand in kilowatt-hours is obtained by estimating the value in kilowatt-hours of the graphs in each hourly section. The mileage is calculated likewise, and from these two figures the average of kilowatt-hours per car-mile is plotted.



SLACK IN SCHEDULES—FIG. 4—HOURLY DEMAND GRAPH FOR PARTICULAR CASE AND DATA FOR ITS DETERMINATION

From Fig. 4 it may be seen that, between the hours of 7.30 a. m. and 8.30 a. m. the energy consumption is 4 kw.-hr. per car-mile. This energy consumption, together with the known schedule speed of 10 m.p.h, which applies in the case of the records shown on Fig. 4, establishes a point on the "service-characteristic" diagram of Fig. 2. It will be found, however, that this point falls above or to the right of the curve "Maximum Possible Performance," and at first glance it might appear that the readings of kilowatt-hours per car-mile must have been in error. However, this is in the rush-hour period. The men all ran behind time! They could not make the required schedule speed of 10 m.p.h. but they operated as best they could, or with zero slack. The line of zero slack crosses the 4 kw.-hr. per car-mile value at a schedule speed of 9.8 m.p.h., and because of heavy traffic conditions, including slow-downs as well as stops for passengers, the men could only average 9.8 m.p.h. throughout this period, making up this lost time in the succeeding hour.

If it is desired to approximate the most economical schedule speed for this particular "equivalent-service" demand, trace a curve of the same trend as curve No. 8 from the point on the diagram that indicates 4 kw.-hr. and 9.8 m.p.h. It will be found to cross the line of most economical performance at a point corresponding to 9.3 m.p.h. This latter speed will provide approximately the most economical operation, as well as plenty of reserve slack with which to prevent the kind of service that is being rendered when a 10 m.p.h. schedule speed is called for and not maintained. It is also to be noted that the 7 per cent decrease in schedule between 10 m.p.h. and 9.3 m.p.h. speed effects a 35 per cent decrease in energy consumption during the hour in question. Coming as it does in the peak-load period, such a saving would go far to offset the increase in other operating expenses that might be expected from the slightly slower movement of the cars.

Similarly, the actual efficiency of transportation, and the actual amount of slack, can be determined for this given line for any hour of the day and the effect of proposed changes in schedules approximately determined. The simplicity of the scheme lies in the fact that the superintendent of transportation can supply himself with a set of service-characteristic diagrams made up from calculated speed-time curves by the engineering department, and by using data on schedule speeds and kilowatt-hours per car-mile, can analyze his traffic conditions and correct his schedule without himself ever even giving a thought to the intricacies of the speed-time curve or making complicated traffic tests.

Handling Complaints from Patrons*

No Complaint Should Be Neglected—Proper Handling Means Better Public Relations—How the Detroit United Complaint Department Works

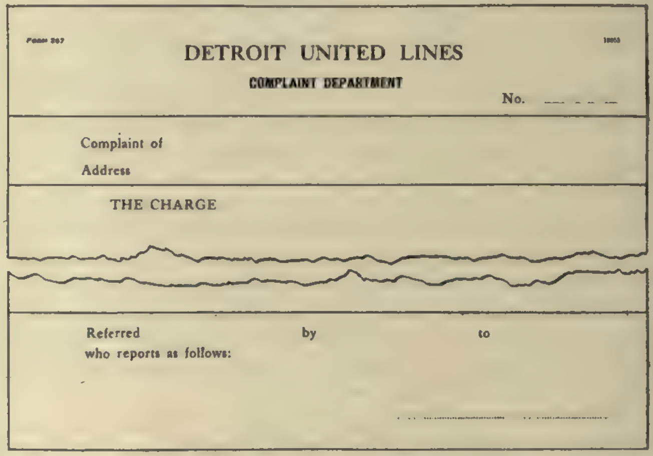
BY A. D. B. VAN ZANDT
Publicity Agent Detroit (Mich.) United Railway

IN friendships and dollars it does not pay any public utility to play ostrich and hide its head against complaints. In my opinion, no complaint is so trivial that a company can afford to treat it with neglect. It is true that each complaint takes up time which, on occasions, we believe might better be devoted to other things. This appears a waste of valuable minutes, but is it?

In considering any complaint we must keep in mind constantly that the complainant is matching his time against ours. He most likely and with reason thinks that his minutes are as valuable to him as our time is to us. In truth, we should be gratified that our patrons think enough of us to spend their time in order that we may know of the things they think have gone wrong.

Have you ever considered that absence of complaints is any evidence that you are free from fault? If that is your self-satisfied viewpoint, it would be well to get it out of your system. Abolish it just as fast as you can, and you may find some things in your organization in need of bracing.

If you are not receiving complaints, the odds are that your patrons have come to the conclusion that you pay no attention to them and that there is no use of them wasting their time. I venture the suggestion, too, that if you are not receiving complaints, you are not receiving any great number of commendations.



DETROIT UNITED LINES
COMPLAINT DEPARTMENT
No.

Complaint of
Address

THE CHARGE

Referred by to
who reports as follows:

HANDLING COMPLAINTS—FORM 1—TRIPLICATE FORM USED FOR TYPING COMPLAINTS

HOW COMPLAINTS CAN HELP TO BETTER PUBLIC RELATIONS

No complaint is so small or so large that it cannot be turned to excellent account in strengthening public relations. In this respect a complaint, properly handled, is second only to good service. Complaints, too, often let you know of the misconceptions in the public mind which you can in many cases correct. Not infrequently, too, complaints give you a better line upon your force than you frequently obtain through your system of inspection.

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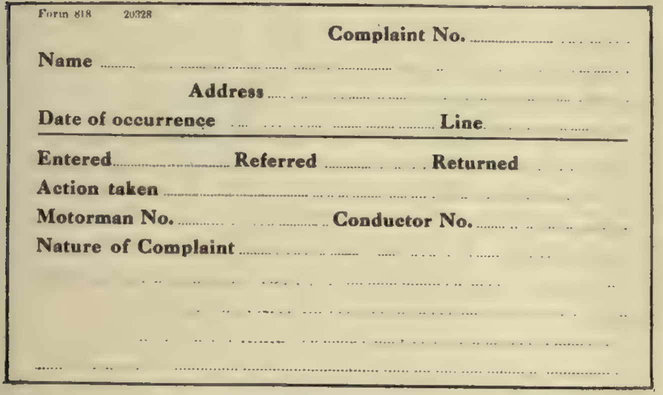
*Abstract of paper read before Canadian Electric Railway Association on June 5, 1917.

Is it not a good thing for your organization when you learn through an accumulation of complaints that Jones is a surly, snarling, offensive conductor; that Smith operates his motor and brakes in a manner that does neither the car nor the passengers any good? Surely. Through a willingness to listen respectfully to complaints you get this and other important information worthy of investigation. You will find any number of patrons willing and glad to be of assistance when they find the management is striving hard toward the goal of perfection. This is one form of publicity you need. It is uplifting.

Is it not equally good for you when you have convinced Mr. Black that your reason for not issuing transfers at a certain point is based upon sensible ground; when you have explained to Mr. Green that a delay in the service was not your deliberate act but was caused by a truck stalling in the track, pointing out to him that any delay is costly to you? Assuredly so. You are educating these men to the point that when the next thing goes wrong they will pause before rushing into print or denouncing your company and its stockholders. This is another form of publicity you need in these days when so many newspapers endeavor to fatten themselves at your expense.


Form 818 20328

Complaint No.

Name

Address

Date of occurrence Line

Entered Referred Returned

Action taken

Motorman No. Conductor No.

Nature of Complaint

HANDLING COMPLAINTS—FORM 2—CARD INDEX RECORD OF COMPLAINT DATA

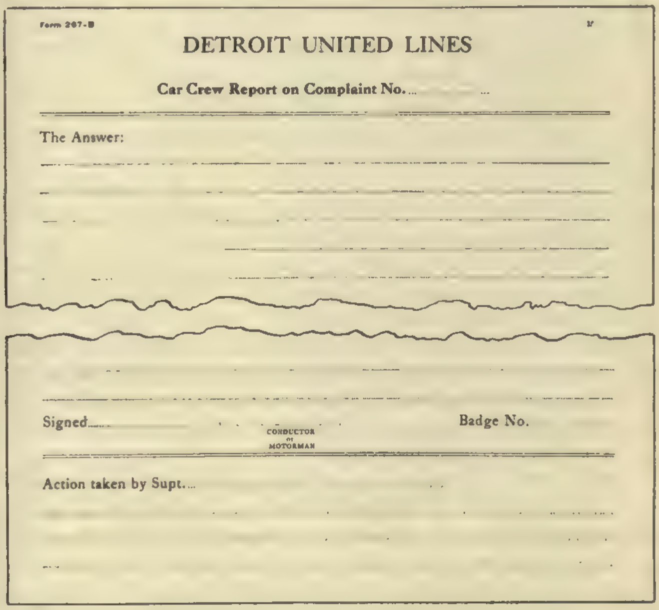
The square treatment of complaints tends greatly toward bettering your relationship with the people who pay you for transportation service. It helps them to know that your people are as human as themselves. It goes far toward counteracting the efforts of political blatherskites who seek to ride into public office by knocking, knocking, knocking.

Prompt, proper and decisive action on complaints does not mean that you should assume a humble, submissive air and admit as right claims that you know are wrong. It is a clear-cut business matter. Nor are you going to convince all the complainants that you are right. You will find many who will fail to come over to your side, for "a man convinced against his will is of the same opinion still."

THE DETROIT UNITED COMPLAINT DEPARTMENT

These, in brief, are the reasons we have for organizing a complaint department on a systematic basis and keeping an accurate record of the handling of complaints from first to last. The Detroit United Railway combines its complaint department with its publicity department. Our complaint department is entirely different from the claims department. The latter, of course, handles possible monetary considerations. It occasionally happens that on completing a complaint investigation there may appear to us the possibility of some one seeking financial damages. In such cases the entire file is forwarded to the claims department for such use as may be deemed necessary. We, however, retain our card index (which will be explained later), making thereon the proper notice of reference.

Complaints which are not immediately closed are typed in triplicate on the record shown in Form 1. This form consists of two white sheets and a blue sheet, each 8 in. x 10¾ in. The blue copy is retained temporarily in the files of the complaint department, until such time as the complaint has been investigated and reported back. In the meantime acknowledgment has been made of the complaint, if it has come through the mails.


Form 267-B

DETROIT UNITED LINES

Car Crew Report on Complaint No.

The Answer:

Signed CONDUCTOR or MOTORMAN Badge No.

Action taken by Supt.

HANDLING COMPLAINTS—FORM 3—FORM FOR SECURING STATEMENT OF EMPLOYEE CONCERNED IN COMPLAINT

After the complaint has been prepared and before it is forwarded for action, the case is entered upon the card index (Form 2), the name and number corresponding for purposes of ready reference. This having been done, the two white copies of Form 1 are forwarded to the disciplinary officer. This official detaches one of these for his checking purposes, and the other he notes and forwards to the superintendent of the line on which the alleged offense occurred.

The superintendent then makes an investigation and secures in writing on Form 3 the statement of the employee concerned. This is a yellow form (8 in. x 10¾ in.) printed on both sides. Thus it may be used by both motorman and conductor if a double statement is called for in the investigation. The superintendent makes a note of his action on the employee's statement, and Form 1, with Form 3 attached, is then returned to the disciplinary officer, who forwards these with his check copy to the complaint department. Here the action taken is marked upon the index card. The blue check copy is then destroyed, the completed file taking its place. At the same time, if deemed necessary, a communication is again sent to the complainant.

This system, it should be noted, allows the superintendent to have a handy reference concerning the record of the employees. For instance, should proof be obtained of an offense that should be entered upon the written record of the employee, notice of this is sent in brief form to the record keeper in the employment department. There a notation giving the complaint number is entered. If the record should at any time be under investigation, the complete case, showing the name of the complainant and all the testimony, is available.

Up-State New York Lines Need Relief—II

The Analysis of Their Condition Begun by the Author Last Week Is Continued by a Consideration of the Allowance Being Made for Depreciation — A Serious Condition Is Disclosed

By THOMAS CONWAY, Jr., Ph.D.
Professor of Finance, University of Pennsylvania, Philadelphia, Pa.

THERE is unmistakable evidence of the growing financial difficulties of the electric railways that operate under the jurisdiction of the Public Service Commission, Second District, of New York. This evidence is furnished by a few comparisons. It will be remembered that, in spite of an increase of some $4,000,000 in gross operating revenue during the five years from 1911 to 1915 inclusive, the net income remaining after the payment of interest and rental charges decreased from $4,294,000 to $933,000. As a natural consequence of this decline in net income, the dividend record of the up-State companies during these years has been progressively more unfavorable. Twenty-six companies paid dividends in 1911; in 1912 the number of dividend-paying companies was reduced to twenty-five; in 1913 it fell to seventeen, while in 1914 and 1915 eighteen companies paid dividends upon one or more classes of stock.

Even more significant is a comparison of the record of the companies which were not only unable to earn dividends but which actually operated at a deficit after meeting interest payments and other fixed charges. The record is graphically presented in Fig. 1, the figures being for the calendar year in each case, that being also the fiscal year of the commission.

In brief, thirty-two companies, or approximately one-half of the total number comprised within the Second District, were operating at a deficit in the year 1915. The increase in the number of companies so operating at a deficit during the last two years, as shown in Fig. 1—or in other words, since the outbreak of the European War—is especially significant. It is, of course, due to the continuous increase in the cost of living of these corporations, which has not yet reached a culmination and which is certain to be higher in the future months than it has been at any time during this period.

United States Supreme Court Has Declared Depreciation Allowance a Duty

Judged solely from the standpoint of the returns paid to security holders, the above record is sufficiently unsatisfactory to warrant efforts for relief. Unfortunately such a comparison does not, in any sense, reveal the dire extremities to which the electric railways are reduced. The worst feature of the current situation is the inability to make adequate provision for depreciation. The public service law of the State of New York provides that "In determining rates of common carriers, railroad and street railroad corporations, the commission shall give due regard, among other things, to a reasonable average return upon the value of the property actually used in the public service and to the necessity of making reservation out of income for surplus and contingencies." The phrase "surplus and contingencies" as here used has been construed by the commissions as including a depreciation requirement.

That such a requirement is constitutional is beyond doubt. The Supreme Court of the United States, in the so-called Knoxville case, decided in 1909, laid down a rule which not only supports the right of the state to require a corporation to make provision for depreciation, but jeopardizes the position of a corporation which does not make such provision. The court said:

"Before coming to the question of profit at all, the company is entitled to earn a sufficient sum annually to provide, not only for current repairs, but for making good the depreciation and replacing the parts of the property when they come to the end of their life. The company is not bound to see its property gradually waste, without making provision out of earnings for its replacement. It is entitled to see that from earnings the value of the property invested is kept unimpaired, so that at the end of any given term of years the original investment remains as it was at the beginning. *It is not only the right of the company to make such a provision, but it is its duty to its bond and stockholders, and, in case of a public service corporation at least, its plain duty to the public.** If a different course were pursued, the only method of providing for replacement of property which has ceased to be useful would be the investment of new capital and the issue of new bonds or stocks. This course would lead to a constantly increasing variance between present value and bond and stock capitalization—a tendency which would inevitably lead to disaster, either to the stockholders or to the public, or both. If, however, a company fails to perform this plain duty and to exact sufficient returns to keep the investment unimpaired, whether this is the result of unwarranted dividends upon over-issues of securities, or of omission to exact proper prices for the output, the fault is its own. When, therefore, a public regulation of its prices comes under question, the true value of the property then employed for the purpose of earning a return cannot be enhanced by a consideration of the errors in management which have been committed in the past."

The above quotation is inserted here because it could hardly be more apposite to the situation of the New York companies if it had been written as a special admonition to these corporations. The Supreme Court of the United States has served a public warning to the utility managers that it is their "plain duty . . . to exact sufficient returns to keep the investment unimpaired" and that "the omission to exact proper prices for the output" is the fault of the company. The court further warned the utilities that it "would not condone errors in management" which resulted in a failure to make adequate provision for depreciation. In the face of this solemn admonition, any public utility which neglects this very important matter is assuming a risk which cannot be justified by prudent standards.

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*Italics are by the author of this article.

NEW YORK STATE HAS SAME POLICY

The New York Public Service Commission for the Second District early in its history clearly set forth its policy with reference to requiring depreciation allowances. In the matter of the application of the Niagara Light, Heat & Power Company for authorization to issue bonds, decided in June, 1909, the commission first announced its policy concerning this important mattter. It appeared that a considerable part of the proposed bond issue was sought to be issued to pay for replacements of part of the applicant's plant which already stood charged to fixed capital. After stating the facts, the commission, in its opinion, remarked, "If the process described is legitimate, it can rightfully be extended to the whole plant it owned seven years ago. When the process is complete, it would owe for two plants; it would represent to the world that it had the value of two plants with which to meet this indebtedness, and yet it would have only one plant. When the new plant in turn became old or worn out, the same process would still be legitimate, and after being carried out, the company would owe for three plants, and have but one; and so on *ad infinitum.*

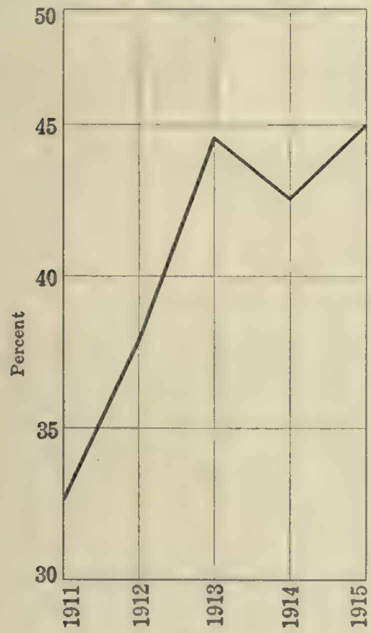

Fig. 1

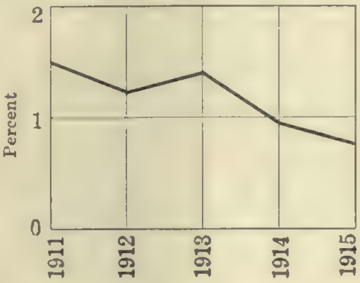

Fig. 2

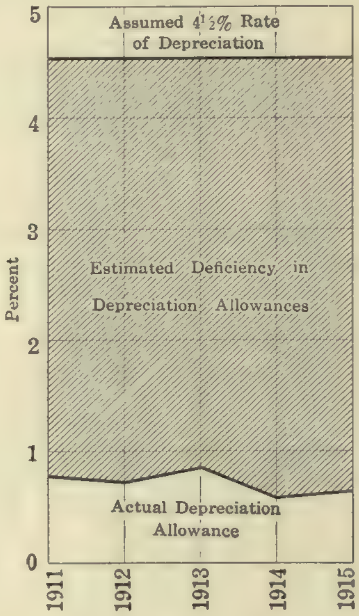

Fig. 3

Fig. 1—Showing percentage of electric railway companies in New York State, Second District, which had a deficit after payment of operating expenses and fixed charges.

Fig. 2—Showing decline, in terms of percentage, that the depreciation fund bears to the total funded debt of those companies which set aside depreciation.

Fig. 3—Showing the actual depreciation allowances of all companies (assuming funded debt to represent physical value), as compared with assumed rate of 4½ per cent.

"This is the exact method which corporations have in large numbers of cases been pursuing, and most unfortunately, as in this case, desire to continue. Where is it to stop? The consequences of such financing are too obvious to require statement. An end to such rottenness of method when the regulating hand of the law does not interfere, finally comes in a dilapidated and useless plant. Bondholders have nothing from which to collect their money. Stockholders have lost all they invested, if indeed they ever invested anything, and the public is given wretched and wholly inadequate service. This is no fancy picture. It correctly delineates what is happening now and has frequently happened in the past. The practice of making replacements with the proceeds of bond issues has been and is one of those most fruitful of evil."

The principle laid down in the above case was reaffirmed and amplified in the decision of the commission on the application of the Binghamton Light, Heat & Power Company for the validation of securities proposed to be issued, decided in August, 1909. The necessity for a depreciation reserve was well stated by the commission in the following manner:

"The greater proportion of the fixed capital of a public service corporation is inevitably worn out or destroyed in performing the service required of it. Ordinary repairs merely delay but can not prevent the inevitable hour when such capital will be dissipated. *This depreciation and final extinction of capital must be borne by the consumer because it is essentially a part of the cost of production of the article or service for which he must pay.** Unless the consumer pays the entire cost of production it is impossible for production to continue permanently."

The rule as here laid down has been steadfastly followed by the Second District Commission and by the courts in the State of New York. There can be no doubt that it is binding alike upon all classes of public utilties.

DEPRECIATION ALLOWANCE NOW ONLY 0.75 PER CENT OF FUNDED DEBT

What provision has been made by the electric railways within the Second District for creating depreciation reserves? According to the reports of the commission, the proportion of companies making depreciation allowances of some character has been as follows: 1910, 38 per cent; 1911, 40 per cent; 1912, 47 per cent; 1913, 45 per cent; 1914, 48 per cent; 1915; 60 per cent. With the exception of one year, there has been a gradual and steady increase in the proportion of companies making some attempt to create a depreciation reserve. It is significant, however, that fully two-fifths of all of the companies operating within the Second District failed to make any provision for depreciation as late as 1915. It need hardly be pointed out that under the rule of the United States Supreme Court such corporations are running the danger of losing a considerable proportion of their original capital investment in a physical valuation, because of the failure to provide proper depreciation.

While the number of companies which have set aside depreciation has steadily increased, yet, because of the growing financial difficulties, the percentage so applied has shown an alarming decrease. For example, the amount of depreciation set aside by the companies making provision for depreciation, as compared with their total funded debt—assuming that the funded debt represents in an approximate way the value of their depreciable property devoted to electric railway uses—was in 1911, 1.49 per cent; in 1912, 1.26 per cent; in 1913, 1.36 per cent; 1914, 0.96 per cent; 1915, 0.75 per cent. Fig. 2 is a graphic showing of the considerable decline in the ratio between the depreciation set aside and the funded debt of those companies making such provision.

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*Italics are by the author of this article.

What Is a Proper Depreciation Allowance?

In the opinion of the writer, the most serious aspect of the current situation of the properties within the Second District is the inability to make proper depreciation allowances. What is a proper depreciation allowance for an electric railway? On this matter there has never been a specific ruling by the Second District Commission. The Wisconsin Commission has held in a number of cases that a corporation should set aside at least 4½ per cent per annum of the total value of its property subject to depreciation. The Massachusetts Commission, in the "Bay State Rate Case," decided in August, 1916, announced that, according to the investigations of its engineers, "the 'composite life' of the entire property, based upon these estimates, proved to be 29.26 years, and the annual depreciation, expressed as a per cent of the total investment, was 3.4 per cent. The 'composite life' of the depreciable property alone was 22.69 years, and the annual depreciation 4.41 per cent."

These reserves are cited as typical depreciation allowances made in recent cases involving a street railway property. A rate of 4½ per cent per annum upon the value of the depreciable property may be taken for our purposes as a rough average to be used in calculating the extent of the deficiency in depreciation appropriations. It should be added parenthetically that it is doubtful whether the rate of 4½ per cent is adequate at the present time. The enormous increase in the cost of all classes of labor necessary for construction work, and of the various classes of materials involved, point unmistakably to the necessity for larger depreciation allowances at the present time. It is variously estimated that under present conditions the cost of identical articles to replace those which must be discarded will range from 30 to 100 per cent above the cost of a few months ago. It would appear very conservative, therefore, for a corporation to ask for earnings sufficient to enable it to set aside 5 per cent per annum as a minimum reserve on the value of its depreciable property.

In the absence of authoritative data concerning the value of the physical property of the electric railways in the Second District, recourse must be had to a method of calculation which will err, in all likelihood, in that it underestimates the value of the depreciable property of these corporations. It is a fact well known to all investment bankers and experienced electric railway executives that conservative banking houses will not float the bonds where the amount of bonded debt outstanding exceeds the physical value of the property of the corporation. Bankers and investors demand physical value at least dollar for dollar for bonded debt, while in a large proportion of cases, a substantial excess of physical value over bonded debt must be in existence. If we assume, for the purpose of illustrating the extent of the deficiency in depreciation allowances, that the physical value of the electric railways in the Second District subject to depreciation is at least equal to the bonded debt of these properties, it is possible to show in a general way how inadequate has been the provision which these corporations have been able to make for depreciation. Fig. 3 shows graphically the amount which should have been set aside for depreciation in each of the last five years upon the basis of 4½ per cent upon the total bonded debt of all of the electric railway companies within the district. In comparison is shown the amount which has been set aside by those companies which were able to make some appropriation. Although the diagram illustrates the alarming discrepancy which exists, yet the full extent of the probable inadequacy of depreciation reserves cannot be appreciated without a comparison of the actual figures. This is given in the accompanying table:

TABLE SHOWING AMOUNT OF DEPRECIATION REQUIREMENT (ASSUMED AS 4½ PER CENT) FOR ELECTRIC RAILWAYS IN SECOND DISTRICT, AMOUNT ACTUALLY SET ASIDE AND ESTIMATED DEFICIENCY

Year	Depreciation Requirement, Assuming it Equal to 4½ % of Total Bonded Debt	Amount of Depreciation Actually Set Aside	Estimated Deficiency in Depreciation Appropriations
1911	$4,013,870	$672,695	$3,341,175
1912	4,082,539	660,731	3,421,808
1913	4,842,994	868,579	3,974,415
1914	5,904,901	753,483	5,151,418
1915	6,080,309	833,106	5,247,203

The reason that the electric railways cannot set aside adequate depreciation is obvious. Their earnings are insufficient. Indeed an argument which alone would warrant the commission to authorize a general advance in rates would be in order that proper depreciation allowances might be made. The year 1915 will serve as an illustration. In that year, the total depreciation reserve set aside aggregated $833,106, and this equalled only 0.326 per cent of the total capitalization of all of the up-State companies, and was equal to only 0.411 per cent of the capitalization of those companies which set aside any depreciation. Four and one-half per cent on the total bonded debt of the up-State companies would require an annual depreciation appropriation of $6,080,309. Against this, the companies actually set aside $833,106, or $5,247,203 less than the required amount. To make such an appropriation would require an increase of 16.8 per cent in the operating income of the companies.

If earnings were increased $5,247,203, the financial position of the companies would be tremendously improved. Instead of having, as shown by the commission's figures for the year ended June 30, 1915, only $10,267,000 applicable to interest and other charges of $9,333,000, the companies would have $15,514,000 out of which to meet fixed charges aggregating $9,333,000. Stating the matter in another way, instead of having net earnings exceeding fixed charges by only 10 per cent, the companies would enjoy an excess of net earnings over fixed charges of 66 per cent.

The Duty of the Commission Plain

With the depreciation situation in mind, it is patent that the question of delaying an advance in rates until a valuation of electric railway properties has been made, is of such minor importance that the commission is undoubtedly warranted in granting an immediate increase in rates, irrespective of valuations. Even though the present unusual conditions did not prevail, the corporations are clearly entitled to a larger revenue. It is their duty, as the Supreme Court of the United States has pointed out, to demand sufficient revenues to make adequate depreciation allowances. The present opportunity should be seized to make this demand in no uncertain terms. The impossibility of making adequate depreciation allowances within recent years should be duly emphasized, and the duty of authorizing an increase in rates to provide for a sufficient depreciation allowance should be strongly suggested to the commission. If this is done, the position of the companies in resisting unwarranted reductions in subsequent valuations because of inadequate depreciation allowances—in case relief is not extended—would be almost impregnable. The fault would lie wholly with the commission whose duty it is to protect not only the traveling public but the investor in public utilities.

It should be further emphasized that the grave inadequacy of revenues, which has existed continuously for a considerable period of time, destroys the argument which might be advanced, that the commission should not increase rates upon the possibility that operating costs will be higher in the future. The financial situation of the up-State electric railways has been intolerable for such a prolonged period of time, that, even though the present acute and distressing situation did not exist, substantial relief would be imperative. With the prices of labor and materials mounting day by day, there can be no doubt that the commission will be justified in taking prompt action to relieve the electric railways from their financial dilemma. In taking such action, the commission can safeguard the interests of the public. It can stipulate that the increases in fare are subject to review at any future time whenever, in particular cases, it is demonstrated that abnormal earnings are produced. Other means can be used which will prevent abuses. A wise constructive course of action is unmistakably to grant immediate relief while, at the same time, stipulating such conditions as, in the judgment of the commission, are necessary to protect the public interest.

Municipal Regulation of Street Railways*

Most Satisfactory Regulation Is That Involving Minimum Interference with Details of Operation—Methods of Determining Adequacy of Service Are Analyzed

By J. W. McCLOY

Service and Equipment Inspector Public Utilities Department, Seattle, Wash.

THE question as to whether the function of regulatory control should be exercised by state or municipal authorities is a live one at present. While the preponderance of opinion among the operating companies favors the former, an undoubted majority of the residents of the larger cities incline toward the latter. The "home rule" agitation is not entirely a creature of the imagination of certain municipal officeholders seeking to broaden their authority. If municipal authorities have not always displayed a proper regard for the financial responsibilities of the traction companies; if local municipal politics have occasionally played too important a part in influencing decisions; and if the policies of municipal governing bodies and the personnel of their members have been subject to frequent change, it can with equal force be asserted that state boards have been subject to the same limitations.

The question of priority of authority can by no means be said to be definitely settled, and a great deal must depend upon the results obtained within the next few years by the two schools of thought. It is probable that municipalities will always reserve the purely police powers to themselves, but beyond the matters subject to ordinary police control is a whole realm of corporate activity affecting in a most vital way thousands of persons. How to exercise a fair and reasonable regulatory authority which will produce the best results for all concerned is the question.

METHODS OF DETERMINING ADEQUACY OF SERVICE

Time was when the traction officials used to meet complaints of inadequate service by quoting statistics purporting to show the earnings per car-mile or per car-hour of the line of which complaint was made, and of comparing this showing with similar data of some other line apparently more favored from the standpoint of service. It was usually easy enough to demonstrate that the earnings of the longer lines, on which the heaviest crowding occurred, were comparatively less than the earnings on the short-haul lines, and an argument of this sort was generally looked upon as final and conclusive. Until a few years ago the average street railway management did not pretend to know the per cent of passengers obliged to stand during the rush hours on the various lines composing their systems. Out of this lack of knowledge, coupled with the fact that the stock arguments against increasing the service were beginning to fail, grew the method of determining the adequacy of service by means of the traffic count. The first crude efforts along this line were confined to a study of the conductor's trip sheets, the various classes of fares shown in the total columns of each half trip being added together to show the volume of travel. In this manner all passengers who had been on the car during its half trip were shown in the totals, which were laboriously platted into curves and turned over to the traffic department for the purposes of study. It will be apparent at once that such data were worse than useless, as while many a car might show a heavy total for its half-trip passenger record, such a total would bear little relation to the number of passengers who might have been on the car at any one time.

This method was improved upon by stationing inspectors in the street at the point of maximum load to record the car movements and to estimate to the best of their ability the number of passengers on board. Another method of obtaining the same data is to require the conductor to make a count of his passengers upon arriving at the point of maximum load, recording the result, together with the time at which the car arrived at the point in question upon a blank provided for the purpose. As between the two methods of securing the count, either by street inspector or by the conductor on the car, there is little choice from the standpoint of accuracy; the latter method, however, having the advantage of being the less expensive. In either event when the results are assembled and tabulated and a comparison is arrived at showing the ratio between the passengers carried and the seats furnished, a very interesting record is obtained and the movement and characteristics of traffic can be studied to a nicety.

During the off-peak periods of travel the averages will seldom show a preponderance of standing loads, as it is an almost universal practice in American cities to provide a considerable surplus of seats over passengers during these periods. An exception will usually prevail on Saturday nights when homeward-bound travel will be found to be very heavy far into the hours of the night.

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*Abstract of address delivered before an Extension Class of the University of Washington.

It is during the morning and evening rush periods, which will embrace, roughly, the hours between 6.30 a. m. and 9 a. m. and between 4.45 p. m. and 6.45 p. m., that the overcrowding which usually prevails on cars moving in the controlling direction of traffic constitutes the reproach which is so often fastened upon American cities when comparisons are drawn with cities of Europe. To overcome this overcrowding or at least to reduce it to its lowest possible minimum is the primary aim of service regulation.

DEFINITIONS OF ADEQUATE SERVICE

Franchise provisions and legislative acts affecting urban street railway service usually contain general provisions to the effect that service shall be "safe, adequate and sufficient," "shall meet the requirements of public convenience and necessity," etc.—terms capable of widely divergent interpretations. Unfortunately, the word "rational" seldom finds its way into these orders, whence arise inevitable disagreements, conflicting orders and unhappiness all around, both among those issuing the orders and those upon whom falls the burden of carrying them out.

In determining what constitutes a "comfortable load" an element of pure judgment arises at the outset. One authority seems to have said about all that it is possible to say in stating that "a comfortable load is such that every person under average normal conditions who desires a seat may have one; while those who desire to stand of their own initiative may do so in comfort." Needless to say such a factor as this will be subject to a variation in which the type of car and the rules of the company will play a part. For instance, persons who would not care to stand at the rear of the car might choose to stand on the front platform in friendly converse with the motorman, but this the company's rules might prohibit. But without attempting to be captious the definition above set forth appears to meet the average situation.

The element of time must needs play an important part in evolving a definition of a "convenient service," and here also psychology must play a part. On a long suburban line a fifteen-minute headway between cars might not appear unreasonable, might indeed be deemed of great advantage to the district served, but on a line serving one of the closer-in residence districts a wait of fifteen minutes between cars would be deemed outrageous, even if the average passenger load on the longer line were the heavier of the two. The divisibility of the headway into the hourly period is also important from a convenience standpoint; a fifteen-minute headway is preferable to a thirteen-minute headway; a thirty-minute headway is preferable to a twenty-five-minute headway, for the reason that the patron, once he obtains his bearings, so to say, can figure out with reasonable exactness when to look for a car. Where the headway is less than twelve minutes the matter is not of sufficient importance to receive special attention, as the wait between cars will be relatively short at the most. Where the headway is longer than thirty minutes and is still at an odd figure, such as thirty-five minutes, an effort should be made to distribute printed copies of the schedule among the regular patrons.

PROPER THEORIES OF SCHEDULE MAKING

From time to time some commission arrogates to itself the function of drawing up or prescribing operating schedules, but such attempts have almost invariably resulted in confusion and failure. It can be set down as axiomatic that schedule making is a function which belongs peculiarly and alone to the operating department of a street railway, and any interference from outside sources is likely to be disastrous. In the long run it will be found that the most satisfactory regulation will be that which involves the minimum of interference with details of operation.

Regulating commissions have also all too commonly fallen into the error of prescribing maximum loads. While this may be a splendid idea in theory, it is very difficult to apply in practice. The burden of determining when the maximum load has been reached must necessarily devolve upon the conductor, and he is too likely to be otherwise busily engaged when the moment of overload arrives. If the responsibility of limiting the load is put up to some outside authority, it can mean nothing more than a heavy increase in the supervisory expenses of the community, the regulating board or the traction company upon whom, as the case may be, the duty falls. It is a much simpler proposition to provide "car full" signs and leave the matter of their use up to the conductors. With a little coaching the car men should soon become sufficiently well informed to use the signs wisely.

A more sensible and generally accepted method of defining a reasonably adequate service is to set forth a ratio between the number of seats furnished and the number of passengers carried in the controlling direction of traffic during the various periods of the day. This method is now being substantially followed in a number of cities where regulation is most successfully practised and undoubtedly forms the basis upon which all future regulations must be worked out.

It would be a poor service standard order that was not sufficiently flexible to meet the extraordinary conditions which constantly arise in a large city. Physical conditions will often intervene to prevent the maintenance of a set car-loading standard. In many cities—in fact, on certain lines in Seattle—the problem of street congestion is an important factor in limiting car service. Even at the present time, with every prospect of a vast increase in the number of people to be handled, the limit of car movement has practically been reached along First Avenue South for certain short periods during the morning rush hours. In such cases it would, of course, be futile to seek to enforce a service standard equal to that which would apply on other lines under more favorable conditions.

In regulation there is always a far wider field for substantial constructive work than for mere criticism. Good car service implies regularity of headway above everything else, and in insuring this regularity a properly constituted regulatory authority can often accomplish substantial results where even the most able and conscientious operating official would fail. In this field the odds are heavily in favor of municipal as opposed to state control over regulation. In theory, at least, a municipal authority is in closer touch with the local police upon whom rests the final responsibility for facilitating traffic. The fact that this theory is not always applied in practice does not argue against its soundness.

The Department of Public Utilities in Seattle has exerted itself in securing the enactment of certain legislation designed to expedite street railway traffic, and has always stood ready to sponsor any legitimate suggestion which would tend to improve service conditions. Frequent conferences are held between representatives of the department and the traction companies, at which there is a free and helpful exchange of criticism and suggestion. The local traction officials have a wholesome respect for any suggestion emanating from the department, and it is safe to say that more real benefits for the traveling public have been brought about through the agency of friendly conferences than would have been possible by any amount of appeal to legal recourse.

AMERICAN ASSOCIATION NEWS

Manila Section Discusses Lighting

At the meeting of Section No. 5 held in Manila on May 8, F. J. Tew, superintendent of shops, was elected director for two years, and four men from the transportation department were elected to membership. The paper of the evening was by Arthur J. Grant, superintendent of lighting and power installations, on "Lighting," and the discussion related principally to local problems, particularly with reference to meter accuracy.

Section No. 7 Meets in Middletown, Conn.

The sixteenth monthly meeting of the Connecticut Company section was held under the auspices of the Middletown division on May 23, with an attendance of 149. After dinner and a musical program the meeting was turned over to F. A. Hewitt, superintendent of the division.

The formal program comprised an address of welcome by Mayor H. M. Meech of Middletown; a paper on "Car Painting—Past and Present," by Andrew MacGreagor, master painter Meriden division; an address on "The Chamber of Commerce of Connecticut, with Special Reference to Its Recent Report on Taxation," by George Burnham, president of the Chamber, and an address by Prof. H. M. Wriston of Wesleyan University, on "The Relations of the Government to the Railways."

Mr. Meech referred especially to the courtesy that is always extended to committees representing the city of Middletown in their conferences with the officials of the Connecticut Company. Mr. MacGreagor told in a humorous manner the differences in the methods of painting trolley cars to-day as compared with those of 1870. Mr. Burnham mentioned the unfairness of the paving tax assessed against railway companies now, due to certain charter rights that were given to the companies years ago when horse cars were in operation. He explained that this form of tax would presumably be eliminated in the near future, but that a proper tax would be levied in its place. Professor Wriston cited railway conditions in this country compared with those in England and France. He said that abroad public ownership did not work out any better than private ownership and, owing to conditions in this country, it appeared that private ownership is better.

Railway Signal Association Meets

A stated meeting of the Railway Signal Association was held in New York on June 12-13, 1917, reports being presented by standing committees on signaling practice, mechanical interlocking, power interlocking, d. c. automatic block, standard designs, direct-current relays, and alternating-current signaling. Reports were also submitted by special committees on harmonizing specifications and on the signaling requirements of electric railways. The latter committee reported progress only, and confined itself to the statement that it was prepared to co-operate with the American Electric Railway Association, whose committee on block signals is endeavoring to have the two associations consider jointly the matter of block-signal rules, and is preparing recommendations as to certain changes in R. S. A. standards that would be desirable from the standpoint of electric railways. The committee felt that considerable progress had already been made in the way of co-operation between the two associations and toward the adoption of joint standards by both.

Big Cottonwood Demolishes One-Man Car

One of the one-man cars of the Topeka (Kan.) Railway will be in the shop for a few weeks due to the accident depicted in the accompanying photograph. A cyclone passed near Topeka on June 5 and the wind in the city was sufficiently strong to blow over a cottonwood tree which struck the front hood of the car. The conductor and one passenger were slightly injured. The cyclone killed eight people elsewhere and destroyed property valued at $700,000.

VIEW SHOWING THE EFFECT OF THE CYCLONE AT TOPEKA, KAN.

New York State Conference on Six-Cent Fare

Representatives of 80 per cent of the electric railways in up-State New York, under the jurisdiction of the Public Service Commission for the Second District, met in Syracuse on June 12 to help map out definitely a campaign for increased fares on city lines. The meeting was held under the direction of the up-State division of the committee of ten appointed by the New York Electric Railway Association to consider ways and means of increasing revenues.

As before stated in the ELECTRIC RAILWAY JOURNAL, the companies in the First District, or New York City, have in the main already applied for permission to charge for transfers. The exact course to be followed by the up-State companies has not been finally determined, but their general views as expressed to the committee seemed to be in favor of making a flat increase of 1 cent so as to charge a 6-cent fare on city lines. One small company suggested that it would require a 7-cent fare. There was also some discussion as to the advisability of seeking relief from certain operating burdens, especially from paving and snow-removal charges and some forms of taxation.

It was stated at the close of the session that each company was to outline its needs, and that some general plan would be devised to place before the up-State commission. It is expected that petitions for permission to charge higher fares will soon be filed in Albany.

Joseph K. Choate, vice-president J. G. White Management Corporation, New York, N. Y., presided at the meeting as chairman of the association committee. Thomas Conway, Jr., Ph.D., professor of finance, University of Pennsylvania, Philadelphia, Pa., addressed the railway men on the economic side of the present situation, and Martin S. Decker, formerly a public service commissioner in the Second District, also spoke as a representative of some of the companies. Ivy L. Lee, who will be in charge of publicity in connection with the movement for increased fares, was present at the meeting.

COMMUNICATION

Advocates Springs Over Journal Boxes

NEW YORK, May 25, 1917.

To the Editors:

In the several communications that you have recently published on truck equalization, those of Messrs. Phillips and Pittenger, which appeared in the issue of May 12, are of particular interest in connection with equipment for city service. The writer agrees with both in part but also takes issue with both on certain points.

The arch-bar truck that is advocated by Mr. Phillips is light in weight, it is true. But sound construction has been sacrificed for this weight reduction. As there is no journal cushion, the frame outside of the bolster springs is subject to strain and torsion, and this brings about the difficulties referred to by Mr. Pittenger.

Mr. Phillips says further that the side frame and transom of the arch-bar truck have a knife-edged connection. This is true, but at this point the truck has an insufficient lateral connection. There is no transverse bracing and the truck becomes skewed, giving the wheels a tendency to hug the rails and causing stress in the truck frame. The connections work loose, and the nuts are shaken off, while excessive power is required to propel the car. Doubtless some of these ill effects are transmitted to the car body and to the track.

As to the good riding qualities of the arch-bar type of truck, the writer must differ with Mr. Phillips, since he was in Pittsburgh when these trucks were placed under trailers. The riding qualities were such that it seemed unlikely that they would be used under motor cars or considered for permanent equipment.

With the pedestal type of truck, which is advocated by Mr. Pittenger, the reduced maintenance is partly due, no doubt, to method of construction rather than to type. Machine-fitted bolts and similar applications of high-grade workmanship contribute materially to resist racking due to poor track, although at the same time, the equalizer-bar truck with the cushion placed quite close to the journals has an advantage over the design where the motors are journaled to the axle without cushion of any kind.

However, the writer believes that better results can be obtained without the equalizing bar by placing the springs directly upon the journal boxes. This saves the weight of the equalizer bars and eliminates the uncushioned dead weight on the journal box, as well as the rattling noise referred to by Mr. Phillips in his communication. The equalizing bar at best is a relic of the wooden truck, and when wooden trucks were used it was valuable because it prevented the wooden truck beam from breaking down. With this design the points of support at the equalizing springs were placed nearer to the center of the beam, thus making the equalizing bar carry part of the load between journals.

Another point in favor of using springs over journal boxes is that this provides a design where the brake head and shoe are clear of obstruction, and inspection and repairs are facilitated in comparison with the design where equalizing bars are used.

JOHN FRANCIS.

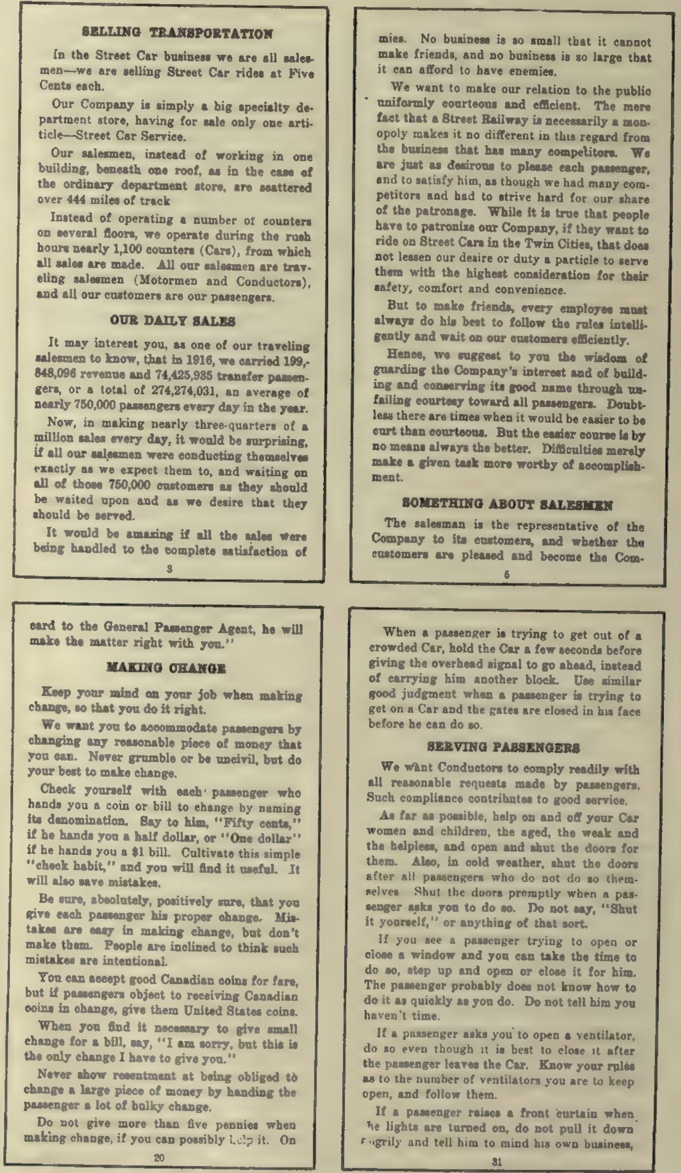
The Union Traction Company, Coffeyville, Kan., has installed a steam locomotive on its 24-mile line to Nowata, Okla., to take care of the increased freight traffic, the present electrical equipment of the company not being equal to handling the unusual increase. The steam locomotive makes two trips each way a day.

Selling Rides in Minneapolis

Company Issues to Its Employees a Pamphlet Containing Practical Suggestions on How to Treat the Public

THE Twin City Rapid Transit Company has recently issued to all trainmen a pamphlet of forty-four pages containing suggestions on how they should carry on their daily work. The pamphlet is not a rule book but rather a short treatise on "selling rides." It compares the company to the merchant and the employees to the salesmen, and the idea expressed is that both merchant and salesmen should see that the customers are satisfied with their purchases. The pamphlet is not intended as a substitute for the rule book, but to instill the proper spirit of public service in the men to whom it is addressed.

The introduction, which is signed by President Lowry, says that the suggestions in the pamphlet were compiled by A. W. Warnock, general passenger agent, with the single educational purpose in mind of explaining "What to do and how to do it" in order to give patrons the best possible street car service. Typical pages of this pamphlet are shown in the illustration below.



SELLING TRANSPORTATION

In the Street Car business we are all salesmen—we are selling Street Car rides at Five Cents each.

Our Company is simply a big specialty department store, having for sale only one article—Street Car Service.

Our salesmen, instead of working in one building, beneath one roof, as in the case of the ordinary department store, are scattered over 444 miles of track

Instead of operating a number of counters on several floors, we operate during the rush hours nearly 1,100 counters (Cars), from which all sales are made. All our salesmen are traveling salesmen (Motormen and Conductors), and all our customers are our passengers.

OUR DAILY SALES

It may interest you, as one of our traveling salesmen to know, that in 1916, we carried 199,848,096 revenue and 74,425,935 transfer passengers, or a total of 274,274,031, an average of nearly 750,000 passengers every day in the year.

Now, in making nearly three-quarters of a million sales every day, it would be surprising, if all our salesmen were conducting themselves exactly as we expect them to, and waiting on all of those 750,000 customers as they should be waited upon and as we desire that they should be served.

It would be amazing if all the sales were being handled to the complete satisfaction of

3

mies. No business is so small that it cannot make friends, and no business is so large that it can afford to have enemies.

We want to make our relation to the public uniformly courteous and efficient. The mere fact that a Street Railway is necessarily a monopoly makes it no different in this regard from the business that has many competitors. We are just as desirous to please each passenger, and to satisfy him, as though we had many competitors and had to strive hard for our share of the patronage. While it is true that people have to patronize our Company, if they want to ride on Street Cars in the Twin Cities, that does not lessen our desire or duty a particle to serve them with the highest consideration for their safety, comfort and convenience.

But to make friends, every employee must always do his best to follow the rules intelligently and wait on our customers efficiently.

Hence, we suggest to you the wisdom of guarding the Company's interest and of building and conserving its good name through unfailing courtesy toward all passengers. Doubtless there are times when it would be easier to be curt than courteous. But the easier course is by no means always the better. Difficulties merely make a given task more worthy of accomplishment.

SOMETHING ABOUT SALESMEN

The salesman is the representative of the Company to its customers, and whether the customers are pleased and become the Com-

5

card to the General Passenger Agent, he will make the matter right with you."

MAKING CHANGE

Keep your mind on your job when making change, so that you do it right.

We want you to accommodate passengers by changing any reasonable piece of money that you can. Never grumble or be uncivil, but do your best to make change.

Check yourself with each passenger who hands you a coin or bill to change by naming its denomination. Say to him, "Fifty cents," if he hands you a half dollar, or "One dollar" if he hands you a $1 bill. Cultivate this simple "check habit," and you will find it useful. It will also save mistakes.

Be sure, absolutely, positively sure, that you give each passenger his proper change. Mistakes are easy in making change, but don't make them. People are inclined to think such mistakes are intentional.

You can accept good Canadian coins for fare, but if passengers object to receiving Canadian coins in change, give them United States coins.

When you find it necessary to give small change for a bill, say, "I am sorry, but this is the only change I have to give you."

Never show resentment at being obliged to change a large piece of money by handing the passenger a lot of bulky change.

Do not give more than five pennies when making change, if you can possibly help it. On

20

When a passenger is trying to get out of a crowded Car, hold the Car a few seconds before giving the overhead signal to go ahead, instead of carrying him another block. Use similar good judgment when a passenger is trying to get on a Car and the gates are closed in his face before he can do so.

SERVING PASSENGERS

We want Conductors to comply readily with all reasonable requests made by passengers. Such compliance contributes to good service.

As far as possible, help on and off your Car women and children, the aged, the weak and the helpless, and open and shut the doors for them. Also, in cold weather, shut the doors after all passengers who do not do so themselves. Shut the doors promptly when a passenger asks you to do so. Do not say, "Shut it yourself," or anything of that sort.

If you see a passenger trying to open or close a window and you can take the time to do so, step up and open or close it for him. The passenger probably does not know how to do it as quickly as you do. Do not tell him you haven't time.

If a passenger asks you to open a ventilator, do so even though it is best to close it after the passenger leaves the Car. Know your rules as to the number of ventilators you are to keep open, and follow them.

If a passenger raises a front curtain when the lights are turned on, do not pull it down angrily and tell him to mind his own business,

31

PAGES FROM PAMPHLET ISSUED BY THE TWIN CITY RAPID TRANSIT COMPANY

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Electric Railway's Own Forces Construct and Erect Bridge

Fort Wayne & Northern Indiana Traction Company Builds 181-Ft. Steel Warren Truss Without Accident to Employees

BY H. V. NORFORD

Superintendent of Maintenance of Way Fort Wayne & Northern Indiana Traction Company

The design and construction of a 181-ft. steel span over Wild Cat Creek has been accomplished by the Fort Wayne & Northern Indiana Traction Company's own departments without an accident or an injury during the whole of the eight months of hazardous work. Every detail of the span fitted as designed, and the construction was accomplished without borrowing or renting any outside equipment. When everything was in readiness the wrecking of the 181-ft. operative trestle, the moving of the new span into place, and the hooking up of the rails and the overhead wires consumed only one hour and fifty-one minutes, in spite of the fact that the faster jacks of sufficient capacity to move a span of that weight were not available. The wrecking of this trestle and throwing it in the clear took but twenty-six minutes.

The construction previously in use consisted of three 100-ft. deck truss spans resting on concrete piers and two pile trestle approaches with lengths of 795 ft. and 375 ft. respectively. As many of the piles of the 795-ft. or east approach trestle were in bad condition, it was decided to replace this trestle with an earth fill and a steel span, with the exception of a short space at the shore end where it passed over a roadway. This replacement necessitated an embankment totaling 44,500 cu. yd., which was taken from a near-by gravel and sand pit and hauled in 40-cu. yd. gondolas with false bottoms and side doors. By this method an average of 547 cu. yd. per ten-hour day was placed and a maximum of 806 cu. yd. was attained. When the embankment had been raised and the material had been piled above the track sufficiently high to form an embankment with an 18-ft. top, and side slopes of 1½ to 1, a V-board equipped with iron friction shoes was pushed ahead of a gondola truck and the top was prepared for the placing of the ties.

RIVETING THE NEARLY-COMPLETED SPAN ON WILD CAT CREEK BRIDGE

The temporary falsework, shown in the accompanying illustrations, was erected so as to place the center line of the steel span 15 ft. from the center line of the operative trestle. Single bents were driven under each of the intermediate panel points and pile piers were driven under the end shoes. The construction was necessarily such as to be reasonably safe against floods and ice.

The steel span is a riveted Warren truss 181 ft. 8 in. in length with inside clearances of 14 ft. in width and 19 ft. in height. After the steel members had been loaded on flat cars by the company's bridge force and transported to the site the span was erected on the falsework by a derrick car constructed by the company. This derrick car has a 37½-ft. boom capable of lifting 45,000 lb.

When the erecting and riveting of the steel members had been completed the span was decked with 7-in. x 9-in. x 10-ft. ties and 6-in. x 8-in. timber guards, both

VIEW OF OPERATIVE TRESTLE OVER WILD CAT CREEK ON LINE OF FORT WAYNE & NORTHERN INDIANA TRACTION COMPANY

HOOKING-UP THE WILD CAT CREEK BRIDGE FOR RESUMPTION OF TRAFFIC

of white oak, and rails, cut to fit the corresponding joints on the operative trestle, were spiked in place. The single bents under the span were then cut in the clear, and the span was made ready to be moved in place. After the span was placed, and the operative trestle wrecked, it was found that the grade and alignment had been so maintained that a change of shoes was unnecessary, the rail for the false shoes being cut off within the limits of the abutments and covered with concrete for anchorage.

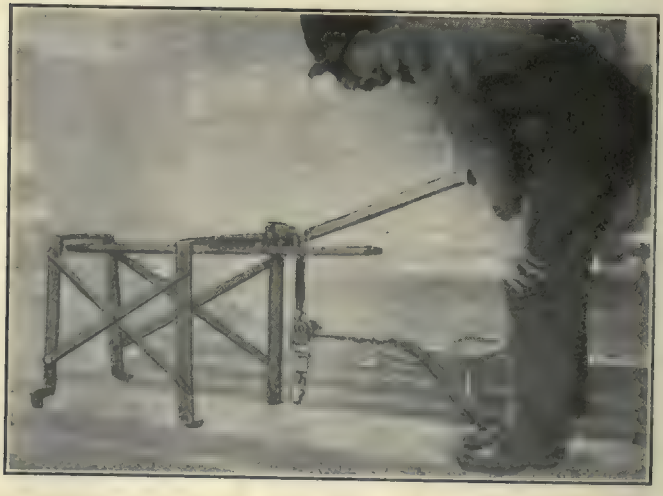
Large Steel Sheets Drilled by Aid of Home-Made Carriage

BY G. B. SISSON
Mechanical Department Georgia Railway & Power Company, Atlanta, Ga.

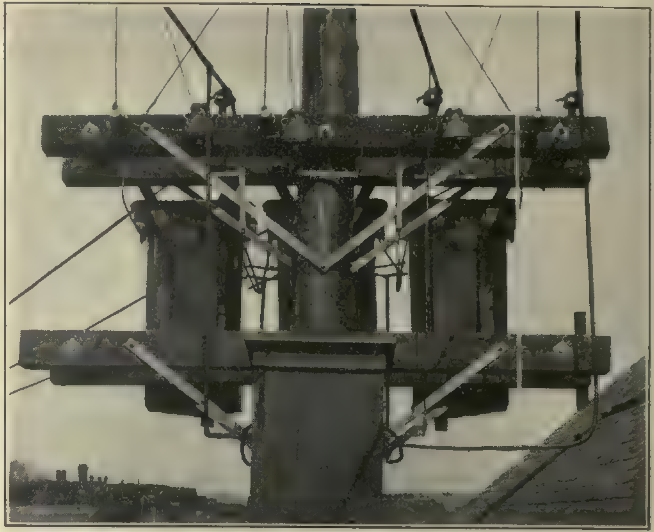
To avoid the trouble and expense of handling long steel sheets over a drill press, a pneumatic drill supported by a home-made carriage is used in our shops for making these holes.

The carriage has a very wide range over which to operate, being arranged to slide lengthways of the sheets while the drill itself can be moved back and forth across the sheets. There is a lever by which hand pressure is exerted on the drill, and when this pressure is released a coiled spring raises the drill out of the work and it is ready for the next hole.

This device allows the sheets to lie flat at all times, and, as it can be operated by one man, it saves a great deal of the labor in handling the long sheets.



CARRIAGE FOR DRILLING LARGE STEEL SHEETS



WIRING OF TRANSFORMERS CRITICISED BECAUSE THE LEAD ON RIGHT WAS TOO LONG

Linemen Criticise Each Others' Work by Aid of Photographs

Most of the jobs carried out by linemen are made in locations which are not readily accessible for inspection so that careless work cannot readily be detected, especially if reliance is placed upon binoculars alone. On the Georgia Railway & Power Company's lines, however, the linemen are so interested in their work that they request that photographs be taken of any job of which they are particularly proud. These jobs, naturally, are the more complicated ones and the very kind that ought to be done perfectly. After the photographs are taken they are framed and hung in the trouble stations. Here they receive the "once-over" by the linemen, and a job must be remarkably good to escape criticism.

One of the accompanying illustrations shows a curve at Washington and Hunter Streets, Atlanta, and proves that the crew that put up this construction had a right to glory in its achievement. On the other hand, when a lineman saw the pole transformer job also illustrated, he said to his fellow-worker: "Didn't I tell you, Bill, that the center lead was too long to get a straight wire?" T. F. Johnson, superintendent of transmission, finds that this self-criticism is more effective discipline than any scoldings. The men have simply learned to take such pride in their work that they do everything possible to earn praise instead of blame.

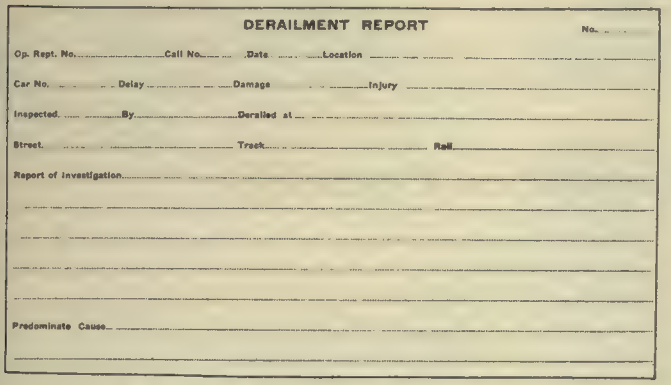
UNUSUALLY GOOD TROLLEY CONSTRUCTION, ATLANTA, GA.

Derailments Reduced by Investigation, Classification and Study of Causes

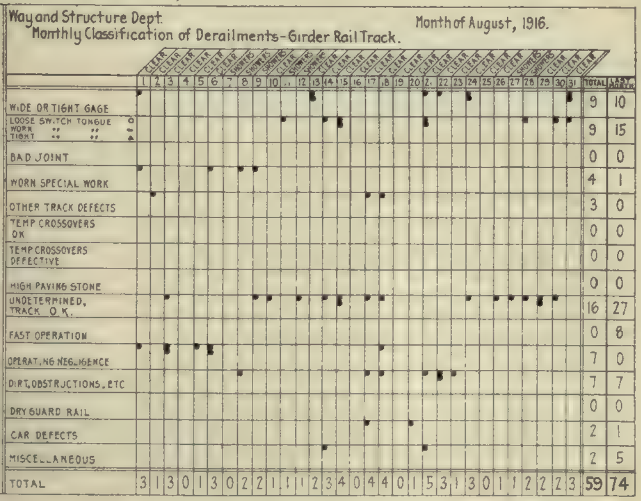
BY M. BERNARD
Assistant Engineer Way and Structure Department Brooklyn Rapid Transit Company, Brooklyn, N. Y.

As careful investigation and classification of derailments has led to a marked reduction in the number of these accidents on this property it may be of interest to outline the method by which these records are handled.

The operating department reports each derailment to the engineer of surface lines who orders an investigation, the result of which is reported to the engineer of way and structure on the form shown in one of the accompanying illustrations. These reports cover all occurrences which can be called derailments whether serious or trivial in their relation to delay of traffic or damage. In the way and structure department these reports are classified monthly according to the causes, the form shown in the illustration below being used. A graphical record is also kept of the different causes of derailment. The graphs reproduced herewith show the proportion of the girder rail derailments to the total, and also show that the whole number of derailments is being greatly reduced. The record is for the total surface single-track mileage of our system, which is about 535.


DERAILMENT REPORT No.
Op. Rept. No. Call No. Date Location
Car No. Delay Damage Injury
Inspected. By. Derailed at
Street. Track. Rail
Report of Investigation.
Predominate Cause.

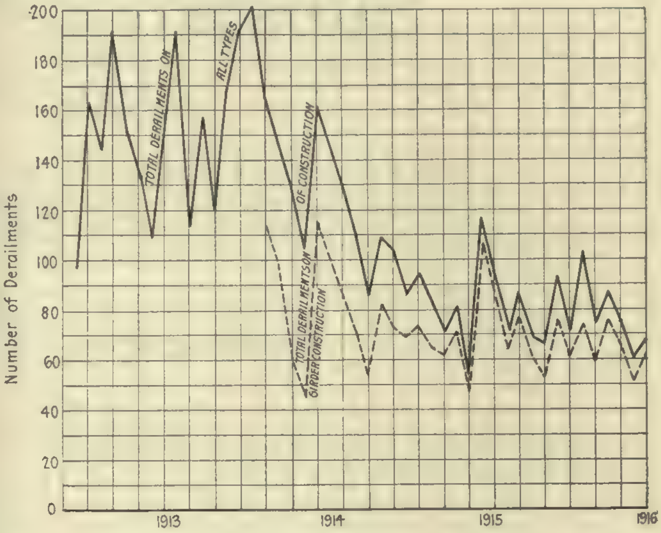
BLANK USED IN REPORTING DERAILMENTS


Way and Structure Dept.
Monthly Classification of Derailments-Girder Rail Track.
Month of August, 1916.

	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	SHOWERS	SHOWERS	SHOWERS	CLEAR	SHOWERS	SHOWERS	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	SHOWERS	SHOWERS	CLEAR	CLEAR	CLEAR		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL	LAST MONTH
WIDE OR TIGHT GAGE	●												⬤								●	●		⬤							⬤	9	10
LOOSE SWITCH TONGUE ○ WORN " " – TIGHT " " ▲											●			●	⬤						⬤							●		●	●	9	15
BAD JOINT																																0	0
WORN SPECIAL WORK	●					●		●	●																							4	1
OTHER TRACK DEFECTS		●															●	●														3	0
TEMP CROSSOVERS OK																																0	0
TEMP CROSSOVERS DEFECTIVE																																0	0
HIGH PAVING STONE																																0	0
UNDETERMINED, TRACK O.K.			●						●	●		●		●	⬤		●	●						●		●	●	●	⬤	●		16	27
FAST OPERATION																																0	8
OPERATING NEGLIGENCE	●		⬤		●	⬤												●														7	0
DIRT, OBSTRUCTIONS, ETC								●									●	●			●	⬤	●									7	7
DRY GUARD RAIL																																0	0
CAR DEFECTS																	●			●												2	1
MISCELLANEOUS														●							●											2	5
TOTAL	3	1	3	0	1	3	0	2	2	1	1	1	2	3	4	0	4	4	0	1	5	3	1	3	0	1	1	2	2	2	3	59	74

MONTHLY CLASSIFICATION OF DERAILMENTS OCCURRING ON GIRDER TRACK CONSTRUCTION

In addition to the information furnished by the formal report, all unusual track conditions likely to lead to derailments are telephoned promptly to the engineer of surface lines, who has them entered on log sheets and promptly investigated and improved. Should there be repeated derailments at any one location a special investigation is made by a derailment committee consisting of one member each from the operating, mechanical and way and structure departments. The reduction in the number of derailments on this property is undoubtedly due partly to the efforts of the derailment committee and partly to the closer inspection methods now in use. Prompt repairs are also made where conditions are reported as likely to lead to derailment.

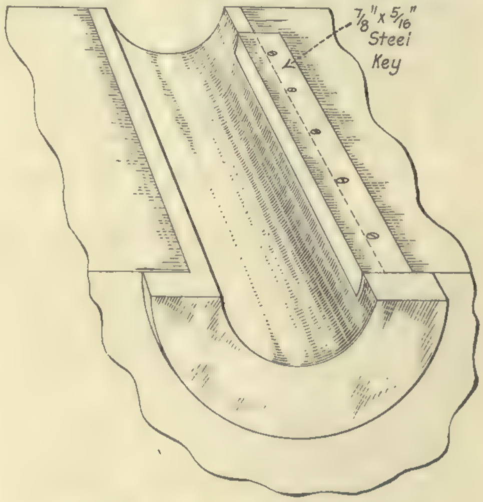


GRAPH SHOWING TOTAL DERAILMENTS AND GIRDER RAIL DERAILMENTS FOR 535 SINGLE-TRACK MILES

In conclusion it may be said that a close study of derailments should tend generally not only toward a reduction in their number, but also toward possible improvements in construction.

Keying Bearing Brasses Eliminates Dowel Pins

A method of keying motor bearing brasses to their housings, thus doing away with the necessity for dowel pins, has been used with good success by H. C. Kaercher, master mechanic Elmira Water, Light & Railroad Company. The accompanying sketch shows how this is done. The key is a piece of 7/8-in. x 5/16-in. steel fastened into a recess in the bearing housing by countersunk screws. The brass is notched out to fit the key.



BEARING BRASS KEYED TO HOUSING

Before a key was used a great deal of trouble was experienced from the dowel pin and hole in the brass becoming so worn that the bearing was allowed to slide around until it often cut off the oil supply entirely.

Substation Operating Rules

Oregon Electric Railway

The following instructions have been in force for some time on the 1200-volt Oregon Electric Railway lines, Portland, Ore. E. R. Cunningham, electrical superintendent, advises that these rules have given very satisfactory results.

Instructions to Substation Operators

Before taking charge of a substation, all operators must learn location of all switches, wires, cables, conductors and current-carrying parts of station that are dangerous and must be avoided.

He must learn names, nature and use of all machines, switches, instruments and various parts of apparatus, and how to operate them under all ordinary and emergency conditions.

He must learn how to clean, repair and properly care for them so as to keep them in good condition and secure best efficiency and operating results from his station.

All operators will be required to pass a rigid examination before taking charge of a substation. The following instructions are intended to assist old as well as new operators as far as possible in the work of operating their station so as to attain best results.

It is difficult to cover all cases of emergency by printed instructions, and operators should avail themselves of every opportunity at their command to acquire a practical working knowledge of apparatus which they have to handle, and when in doubt should ask for necessary information before doing the wrong thing.

It is just as essential to learn what not to do as it is to learn what to do. Operators are especially instructed to familiarize themselves with the "don'ts" in the following instructions:

How to Start a Rotary Converter

1. See that all starting switches are open. (On the 1200-volt rotaries see that d.c. brushes are raised.)

2. Close a.c. high-tension oil switch. (On 1200-volt rotaries first close field break-up switch in upward position.)

3. Close a.c. starting switch in upward position. (In case of six-phase machines with tandem switches, both a.c. starting switches should be closed in up position.) The machine will then come to speed and lock in step, which will be indicated by cessation of beats or vibration of the d.c. voltmeter. If d.c. voltmeter does not come up in the right direction, close field break-up reversing switch in downward position until voltmeter comes back to zero, then open and wait for voltage to come up in right direction. If it does not come up in right direction, repeat the above process until it does.

4. When voltage as indicated by d.c. voltmeter comes up in right direction, throw a.c. starting switch quickly from up to bottom position. (With six-phase rotaries, having tandem starting switches, throw left-hand a.c. starting switch down quickly to bottom contacts, then throw right-hand a.c. starting switch down quickly to bottom contacts.)

5. On 1200-volt rotaries lower d.c. brushes.

6. Adjust d.c. voltage to approximately that of busbars.

7. Push up low-voltage release of circuit-breaker and close circuit-breaker.

8. Close main rotary switch.

9. Adjust division of loads between machines, if more than one is in service, by means of rheostats. Observe power factor meter and adjust fields of rotaries by means of rheostats so as to keep power factor as near 100 per cent as possible.

How to Shut Down a Rotary Converter

1. Open d.c. rotary circuit-breaker. (It is advisable to open d.c. rotary circuit breaker by throwing the speed-limit switch on end of rotary when shutting down in order to keep speed-limit and low voltage release device working properly.)

2. Open main rotary switch.

3. Open high-tension a.c. oil switch. (Allow voltage to run down below 100 before opening field break-up switch.)

4. Open field break-up switch.

5. Open a.c. starting switch.

6. On 1200-volt rotaries raise d.c. brushes.

7. After voltage has dropped below 100 and field switch and starting switch have been opened, it is advisable to wipe commutator with a clean cloth while armature is still coasting.

Treatment of Commutator and Brushes

Commutator should be cleaned with canvas or cheesecloth wiper only. *Gasoline must not be used.*

No free oil of any kind must be used, but when necessary, commutator should be cleaned and sufficiently lubricated by wiping with clean cloth moistened in good grade of clean, light oil.

When necessary to wipe commutator while in operation, it must be done by means of cloth on end of dry stick at least 4 ft. long and it is always advisable to do it at such times when there is little or no load on rotary, when d.c. breaker may be opened to prevent flashover.

Whenever machine is shut down, the commutator should be wiped off thoroughly, d.c. brushes taken out of their holders, and wiped off and inside of holders wiped out. This should be done daily, or as often as it is necessary to keep brushes working freely in their holders.

The secret of good commutation is in keeping brushes working freely in brush holders, and making good uninterrupted contact with the commutator. If this is done and commutator is kept clean, it will rapidly acquire highly polished surface of chocolate brown color and require much less attention and care than when neglected and allowed to get rough.

When it becomes necessary to sand the commutator, it must only be done when the machine is coasting with the brushes raised and all starting switches out.

After it has been sanded sufficiently, it must be finished by applying No. 00 sandpaper, backed with felting or other suitable padding.

Sandpaper should be oiled on back with machine oil to prevent copper fragments from being imbedded in mica. Surface of commutator should be polished with strip of canvas.

When brushes are changed or commutators sanded, brushes must be fitted to commutator by inserting piece of sandpaper under brush and drawing it back and forth, following the curvature of armature with smooth side of paper bearing on commutator and sanded side on brush. After sanding, machine should be thoroughly blown out with hand bellows and all parts wiped clean.

If commutator, brushes and holders and all parts are properly cleaned and cared for it should not be necessary to sand, turn or grind commutator, under ordinary conditions.

The safety of operators and machinery will be increased if the following "Don'ts" are observed:

Don'ts

Don't open field break-up switch until machine voltage has run down below 100.

Don't open starting switches until machine voltage has run down to zero.

Don't open a.c. oil switch with starting switch on starting taps, when field switch is closed and armature revolving, as this would tend to build up voltage on transformers considerably above normal.

Don't close a.c. starting switch when rotary *is coasting with field switch closed.*

Don't close a.c. starting switch slowly.

Don't close any switch slowly.

Don't close machine circuit breaker with machine switch closed.

Don't close feeder breaker with feeder switch closed.

Don't open d.c. machine switch before opening d.c. machine breaker.

Don't open d.c. feeder switch before opening feeder breaker.

Don't close d.c. machine breaker after heavy short-circuit without first plugging voltmeter to converter to see that polarity is not reversed.

Don't start any but 1200-volt rotaries with field switch in up position.

Don't start 1200-volt rotaries with d.c. brushes down.

Don't throw 1200-volt rotaries on line with d.c. brushes raised.

Don't open or close any high-tension disconnecting switch with anything but disconnecting switch rod, provided especially for that purpose, and never open or close them at all under load or when a.c. oil switches are closed.

Don't touch d.c. commutator or brushes or any current-carrying part of machine or 1200-volt system when machine is running, or get in any position where misstep or accidental move would bring you in contact with live parts of machine.

Don't get within 5 ft. or 6 ft. of any part of high-tension system or in any position where misstep or an accidental move would bring you in contact or even in close proximity to any part of high-tension system.

Things You Should Do and When

When a.c. power goes down, open all starting switches as promptly as possible so that your station will be clear when power comes back on line.

When your a.c. oil switch goes out, open rotary breaker as quickly as possible and shut down in usual manner and start up again.

When d.c. breaker comes out, open knife switch on same panel which is in series with breaker, then close breaker; plug voltmeter to rotary or bus to get rotary voltage, then to line to compare line voltage with rotary voltage. If there is not too great a difference, close knife switch quickly. If line voltage is too low and you have reason to think a train is pulling near your station, wait until the motorman shuts off his power (which will be indicated by line voltage rising) before closing knife switch. If breaker comes out again instantly with heavy flash, try and ascertain cause before cutting on to line again and if caused by trolley wire being down on rail, wait until trouble is cleared up before cutting in feeder or feeders that are grounded. If but one feeder is grounded, open feeder breaker and switch on the one that is grounded and leave the ones that are not grounded, so as to operate as much of line as possible.

When any station switch has been ordered out by any authorized person, it will be opened and red card will be hung on operating lever or handle of switch and record will be made on substation log book stating for what purpose switch was opened and by whose orders. After any station switch has been opened and red card hung on it, it will not be closed again except by person who ordered or caused such switch to be opened or by orders issued by person who ordered or caused such switch to be opened. When any one has opened or caused any station or line switch to be opened, he will not close or cause it to be closed again until all whom he has ordered, instructed or allowed to work on line or circuit controlled by that switch have personally reported themselves clear.

When you have trouble of any kind with the equipment in your station, which you cannot prevent by proper care, promptly report same to substation foreman, and if not taken care of, report same to office of electrical superintendent.

How Many Points of Heat?

At the corner of Fifteenth and Arapahoe Streets, in the center of Denver's business district, the Denver Tramway Company has suspended a two-aspect home-made signal which has red over green bull's-eyes, and is visible from all four directions. This was installed for the purpose of informing the trainmen how many points of heat should be carried in the cars. The signal is controlled from the dispatchers' office and is clearly visible for many blocks in any direction from this corner. All car lines in the city pass within one, two or three blocks of this corner, so that the one signal serves for all lines. It is equipped with two 46-watt lamps. When only the red light is showing this indicates one point of heat; only the green light, two points of heat, and with both red and green lights showing, three points of heat.

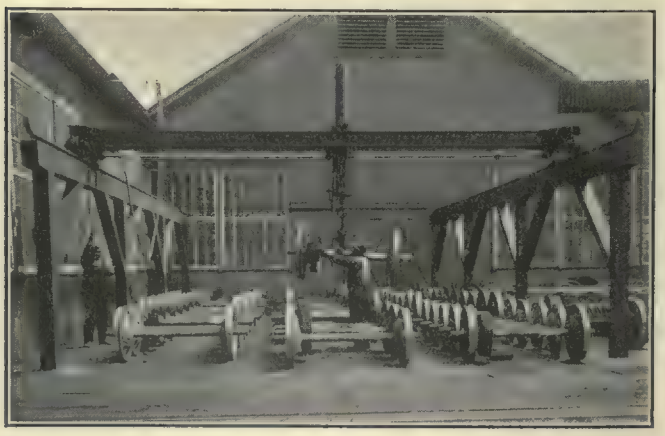
HEAT CONTROL SIGNAL INSTALLED IN HEART OF DENVER

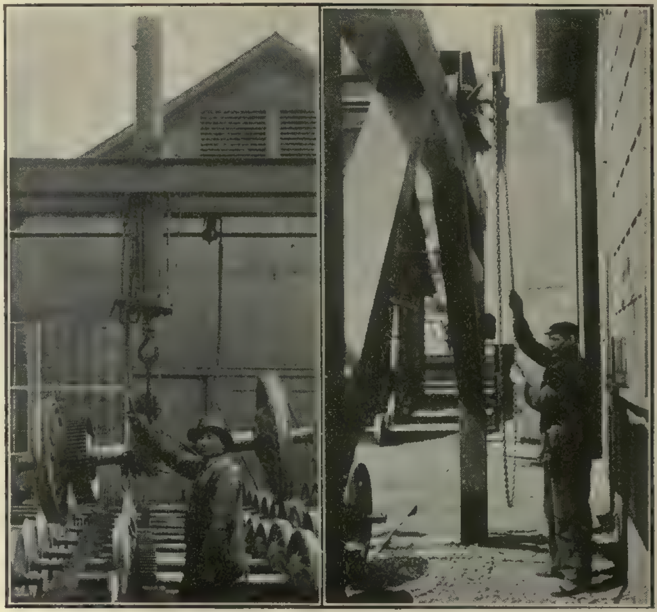
Previously, a cluster of lights at two locations was used for this purpose, but the dispatcher could indicate only when one point of heat should be on. If more than this was necessary, he was compelled to tell each of the car crews as they reported at the ends of the lines, every car being individually dispatched on the Denver system. The new scheme displaced seventy 60-cp. lamps, which were used in the older signals, and substituted the two 46-watt lamps, and at the same time simplified the work of the dispatchers and gave them supervision of the heating current consumption.

Home-Made 4000-Lb. Air Hoist for the Wheel Yard

To increase the storage capacity of its wheel yard and to save time in placing or removing wheels, George St. Pierre, superintendent of equipment San Francisco-Oakland Terminal Railways, devised the hoistway shown in the accompanying illustrations.

The wheel storage, which is three tracks wide and about eighteen wheel sets deep, is flanked by beam trestles which carry a 70-lb. rail for the hoist carriage. This carriage is mounted on four 12-in. double-flange wheels, one of which is connected to a 36-in. power transmission wheel. The hand operation of this wheel by a chain causes the easy movement of the carriage. The home-made air hoist has a 6-in. piston and a lifting capacity of 4000 lb. A man can easily handle a wheel set in a minute or two with this device.


WHEEL YARD WITH HOME-MADE EQUIPMENT


NEAR VIEW OF 4000-LB. HOIST AND TRANSMISSION WHEEL

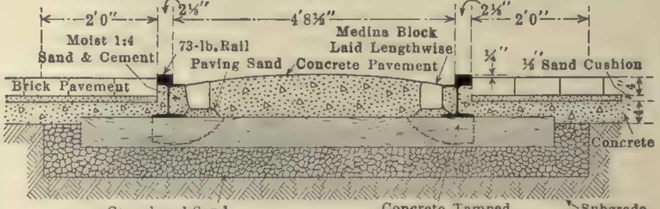
Concrete Paving Laid Where Use of Costly Material Was Not Justified

BY D. P. FALCONER

Engineer Maintenance of Way, New York State Railways, Rochester, N. Y.

The New York State Railways, Rochester, N. Y., has in several instances had to install paving along tracks, the rails of which were not good enough to warrant the use of expensive paving but which were too good to be torn up and scrapped.

In these cases a concrete pavement was installed to solve the problem of providing a cheap material which would last throughout the remaining life of the rail. In some cases, usually on interurban lines, the track construction consisted of creosoted ties laid on a sand and gravel ballast as shown in the accompanying cross-section. Only such ties were renewed as would not last the estimated remaining life. The concrete was laid over this construction and tamped under the rail between the ties as indicated on the drawing.



CROSS-SECTION OF TRACK CONSTRUCTION, ILLUSTRATING USE OF CONCRETE PAVEMENT

The first of this pavement was put down in 1915 at a location where it is subjected to heavy teaming and it has worn well, in fact, without any repairs to date.

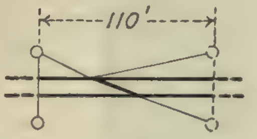
Cost of Erecting Overhead Work—X

(From the records of a large Eastern company)

The following is the tenth group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; March 31, page 606; April 14, page 702; May 12, page 880, and May 26, page 969. The remaining group, which is the last of this series, will appear in a later issue.

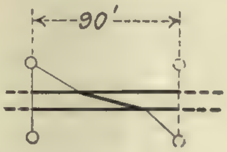
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Right hand crossover



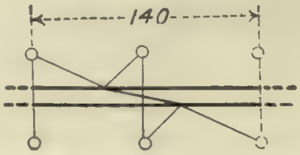
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
70	$9.57	$3.96	$12.76	$5.28	$15.95	$6.60

Right hand crossover



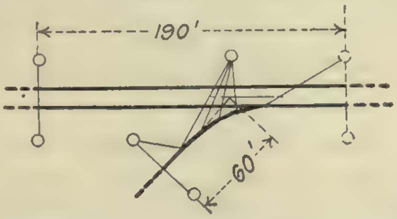
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
71	$9.57	$3.96	$12.76	$5.28	$15.95	$6.60

Right hand crossover



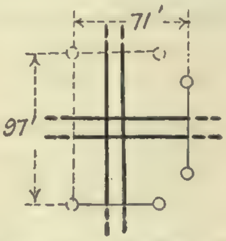
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
72	$12.76	$5.28	$15.95	$6.60	$19.14	$7.92

Single track left hand branch-off, angle 45 deg.



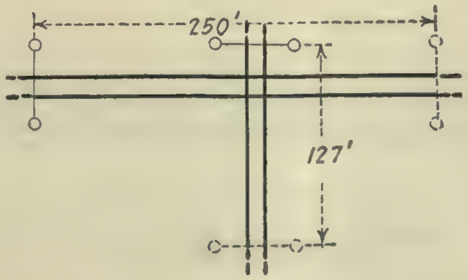
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
73	$15.95	$6.60	$19.14	$7.92	$22.33	$9.24

Double track crossing double track, angle 90 deg.



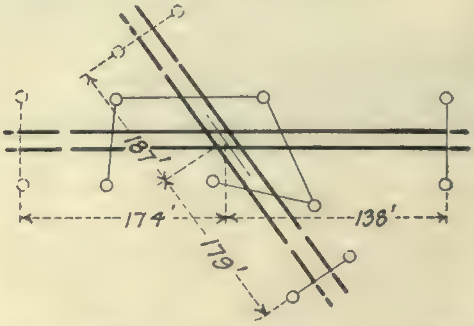
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
74	$15.95	$6.60	$19.14	$7.92	$22.33	$9.24

Double track crossing double track, angle 90 deg.



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
75*	$18.15	$13.20	$21.78	$15.84	$25.41	$18.48

Double track crossing double track angle 45 deg.



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
76*	$27.23	$19.80	$32.67	$23.76	$36.30	$26.40

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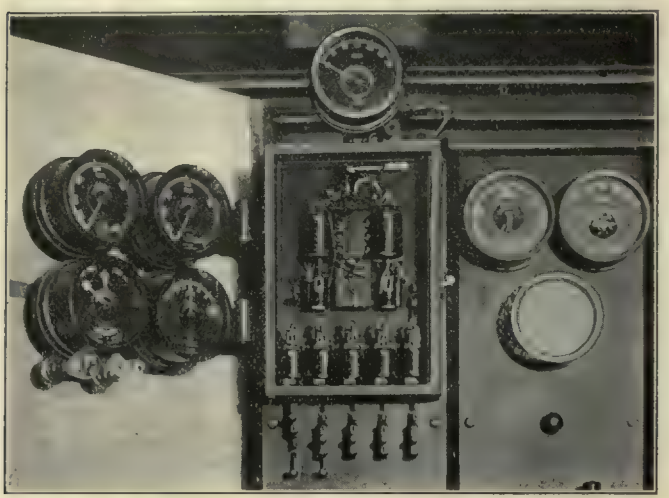
*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Black-Dial and White-Dial Meters

In order to bring out clearly the difference between the appearance on the switchboard of black-dial and white-dial meters, the accompanying illustration was recently made by the Westinghouse Electric & Manufacturing Company. The white-dial meter is in the lower right-hand corner. The principle involved in the black-dial meter is scientifically correct, inasmuch as with the black dial only those parts that are to be observed are illuminated, while with the white dial the parts to be read are obscured and the other parts illuminated. The black-dial meters which were originally brought out for use in cab service on electric locomotives are now popular as switchboard instruments.



VIEW OF SWITCHBOARD SHOWING CONTRAST BETWEEN BLACK-DIAL AND WHITE-DIAL METERS

Convenient Method for Furnishing Light to Repair Gangs

An efficient means for furnishing light, where repair or construction work is in progress at night, is afforded by the so-called "Golden Glow" projectors furnished by the Electric Service Supplies Company, Philadelphia, Pa. They are furnished in different types with various control mechanisms, so that they may be installed on the roof of the cab of a car, with the control shaft extending through the roof to a point in close proximity to the motorman or conductor. Fig. 1 shows one of these projectors attached to the cab of a flat open car.

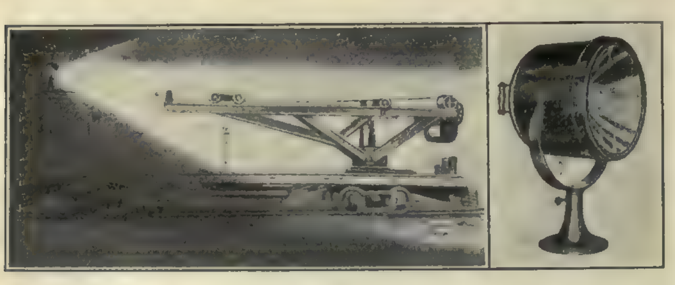


FIG. 1—FURNISHING LIGHT FOR CRANE CAR. FIG. 2—CLOSE VIEW OF PROJECTOR

The light projected is of a greenish-yellow color and has been found particularly desirable for floodlighting due to its non-blinding qualities and, therefore, permits the workmen to observe more detail than would be possible under the conditions that the ordinary white light imposes. These projectors—see Fig. 2—consist of standard cylindrical lamp bodies fitted with handles and supported on heavy malleable-iron forks and cast-iron bases. They are equipped with a standard focusing device which permits the light being directed in a straight concentrated beam or dispersed to cover a large area. Either 9-in. or 12-in. reflectors may be used.

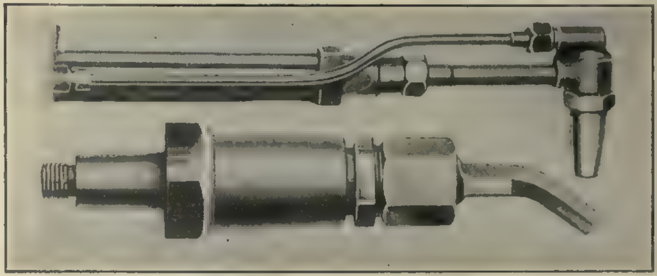
A Condulet Designed for Safety First

A condulet switch built along safety-first ideas has just been put on the market by the Crouse-Hinds Company, Syracuse, N. Y. It consists of a fused knife switch, inclosed in a cast-iron body which has a hinged cover. A door in the cover which opens into the fuse compartment is so designed that it cannot be opened when the blades are in the "on" position, and in this way provides absolute protection to the person removing the fuses. The switch is operated by a handle outside the case and provision is made for locking it in either the "on" or "off" position by use of a padlock.

SAFETY-FIRST CONDULET SWITCH

New Rivet-Cutting Torch Attachment

To meet the need for a cutting tip especially adapted to cutting off rivet heads and staybolts the Prest-O-Lite Company, Inc., Indianapolis, Ind., has developed the tip shown in the lower of the accompanying illustrations. In order to make a good job in cutting off rivet heads and staybolts flush with plates, by the oxy-acetylene processes, it is desirable to have a cutting tip designed to permit the gas jet to play parallel with the plates. This can be done with the attachment shown because the copper tip is bent at a convenient angle and is adjustable to any position, facilitating operation in close quarters. The attachment is used in connection with the standard blowpipe made by this company, being screwed into the head in place of the regular cutting nozzle.



HEAD OF OXY-ACETYLENE BLOW PIPE WITH REGULAR CUTTING NOZZLE—SPECIAL ATTACHMENT FOR RIVET CUTTING REPRESENTED ON ENLARGED SCALE

News of Electric Railways

Traffic and Transportation

Financial and Corporate
Personal Mention
Construction News

Outcome in Philadelphia Uncertain

Conferences Discontinued—Bills Before the Senate Committee in the Interest of the City Reported Out—New Lease Proposal Suggested

Another conference was held on June 6 between representatives of the city of Philadelphia, Pa., and officials of the Philadelphia Rapid Transit Company. No agreement was reached on the enabling transit legislation which is pending at Harrisburg. The session lasted four hours. At its conclusion Joseph P. Gaffney, chairman of the finance committee of Councils, said that a report would be made to the Mayor on the following day.

On the following day, June 7, the joint councilmanic committee on finance and street railways reported the proposed lease negatively. The committee also reported negatively the bill submitted to Councils on Oct. 10, 1916, embodying the terms of the co-operative agreement of 1914 between the city and the company as revised by Transit Director Twining. An ordinance was then introduced and reported with a favorable recommendation, authorizing Transit Director Twining to prepare and present to the transit company for its acceptance or rejection a lease "fair alike to the city and the transit company for the operation of the city's high-speed lines." This ordinance will be called up on June 21. At once speculation began as to the terms of the new lease. It was said that the lease will be so drafted that should it be rejected by the Philadelphia Rapid Transit Company it can immediately be submitted to an independent operator without change.

Meanwhile there was much discussion of the probable final disposition of the bills before the Legislature. The company continued to oppose them for the reasons reviewed in the ELECTRIC RAILWAY JOURNAL of June 2, page 1019.

LEGISLATIVE MEASURES REPORTED FAVORABLY

On June 12 the measures were reported favorably by the judiciary general committee of the Senate. This action was on motion of Senator McNichol, who some time previously had insisted on further conference between the city and the company in an effort to reach an understanding. The committee voted on the bills following a public hearing. At this hearing Mayor Smith, Mr. Gaffney, Mr. Twining and Dr. William Draper Lewis, special legal adviser, appeared for the city. They contended that the city was at the mercy of the company; that nothing but injustice to the people could result from the failure of the Legislature to pass the bills, and that a square deal to both the people and the company was assured by the proposed legislation. The provisions of the four bills have been reviewed previously in the ELECTRIC RAILWAY JOURNAL. The Salus bill would give the Public Service Commission the right to fix and regulate joint service between the city's system and the lines of the Philadelphia Rapid Transit Company. The Gans bill embodies simply the through routing feature of the Salus bill. The Hecht eminent domain bill would permit the city to take over existing lines by the exercise of the power of eminent domain, if they were necessary as constituent parts of the city's system. The price for the properties thus taken would have to be approved by the Public Service Commission or, if no agreement could be reached, then by the courts. The Hecht constitutional amendment would make it possible for the city to exceed the 10 per cent borrowing limitation if the proceeds were to be used in the construction, purchasing or condemnation of any public utility.

On the convening of the Senate on June 13 Senators Daix and Jenkins reported the bills to that body. They will come up on first reading on June 18 and will reach the final passage stage in the Senate on June 20.

Dallas Deal Arrangements

Messrs. Hobson and Strickland Arranging to Take Over Railway and Lighting Properties in Accordance with Previous Plans

With the settlement of all suits involving the legality of the elections at which the so-called service-at-cost electric lighting and traction franchises of the city of Dallas, Tex., were adopted, the way is cleared for C. W. Hobson and J. F. Strickland to take over these properties under the terms of the consolidation agreement between the traction and lighting interests and the city government.

The franchises as adopted at the recent city election gave Messrs. Hobson and Strickland ninety days in which to complete details for taking over these properties. The time limit will expire soon, but the work of drawing up papers and making final arrangements for a transfer of the railway properties to the company that is to be organized by Mr. Hobson is under way. Two Dallas companies will be organized to take over the properties, one by Mr. Hobson to take over the traction lines and the other by Mr. Strickland to take over the electric lighting properties. Mr. Hobson has a guarantee from Stone & Webster that all outstanding securities of the old companies will be delivered.

Most important to the city of Dallas, in connection with the reorganization of the traction and lighting companies, is the agreement to spend large amounts in extensions, betterments and improvements within stipulated time. Proposed extensions and betterments, including two new interurban lines, each at least 30 miles in length, are already well in their formative state. Some have even been agreed on and orders for their completion passed by the City Commission of Dallas.

Messrs. Hobson and Strickland executed bonds aggregating $1,000,000 to the city of Dallas to guarantee fulfillment of their part of the contract. Under the new company, all street railway lines in Dallas, including the Oak Cliff lines now under the direct control of and being operated by the Northern Texas Traction Company, a Stone & Webster property, will be consolidated and operated as one company.

Montreal Men Get Increase

A copy of a letter written by J. E. Hutcheson, general manager of the Montreal (Que.) Tramways, to A. Gaboury, superintendent of the company, has been posted in the carhouses, informing the men that the management had decided to accord them a general increase of 2 cents an hour on the former scale of wages. This means that after July 1, when the new scale goes into effect, conductors and motormen will receive for the first two years of their service with the company 25 cents instead of 23 cents an hour, for the next two years 26 cents instead of 24 cents, and after five years of service 29 cents instead of 27 cents an hour.

Mr. Gaboury, in making this letter known to the men, remarked that the increase was entirely unsolicited and that the company had made it in spite of the fact that all the costs of operating have been greatly increased since the war began.

Mr. Hutcheson, in the course of his letter to Mr. Gaboury, expressed the appreciation of the management of the loyal service by the conductors and motormen since the war began, when the high cost of everything made operating conditions very difficult, and said the officers were confident that the faithful co-operation given in the past for economical, safe and efficient service will continue in the future.

The men will still pay half the cost of their uniforms in the first three years of service as hitherto, but after that they will receive their uniforms free from the company.

Washington Inquiry Nearing End

The end of the inquiry by the Senate committee into the recent strike of the employees of the Washington Railway & Electric Company, Washington, D. C., would seem to be in sight. At the close of the session on June 11 counsel for both sides indicated that all testimony would be completed by June 12 and that argument would then be begun.

A recent witness before the committee was Edward McMorrow, a member of the general executive board of the Amalgamated Association. On questioning by George P. Hoover, counsel for the company, Mr. McMorrow denied that the union was insincere in suggesting that President Wilson act as an arbitrator or that the union in suggesting Mr. Wilson tried to put President King of the company before the public as defying the President of the United States.

Mr. Hoover took up the long list of Amalgamated strikes within the last two years and asked Mr. McMorrow if this or that strike had not been called because the company in question refused to recognize the union. He denied that this had been so in any of the cases mentioned. Mr. McMorrow explained that the Amalgamated Association did not insist upon the closed shop because it could not furnish members to the companies operating roads whenever they needed men. In this the Amalgamated differed from the ordinary trade union. In the printing trades, for instance, the unions guarantee a supply of labor, and if a union shop desires to increase its force and men are not readily obtainable it must seek union aid in filling any gaps in its organization, union shops even going to the extent of loaning men to other similar concerns.

West Side Bills Signed

Governor Whitman of New York has signed the "West Side" bills. One of them, the Green bill, is for another investigation of the whole question of the relations of the city of New York to the New York Central Railroad, in the matter of this public improvement, and for recommendations of a sound policy. The policy of investigation is also laid down in the other bill, the Ottinger bill, which the Governor has approved. It was supposed that if the Governor signed the latter he would veto the former. The Ottinger bill is virtually a measure drafted by the Public Service Commission. To that commission it gives a degree of joint jurisdiction with the Board of Estimate; it leaves open the door for a voluntary agreement between the railroad and the city until Dec. 1, 1917; after that date, and in default of an agreement, the company is to be compelled to remove its tracks and change its grades. The end sought to be achieved in the so-called West Side improvement is the removal of the tracks of the New York Central Railroad from the surface marginal way along the west side of the city close to the Hudson to an elevated structure or subway and their electrification during this work of improvement. The Mayor and the company have expressed the opinion that the new legislation at this time will tend to set back the electrification.

Tunnel-Bridge Commission Appointed

New Jersey has removed the legal restrictions which militated against that State taking up actively the matter of the projected New York-New Jersey tunnel, and Governor Edge on June 8 named a commission to confer with a similar commission from New York. On the New Jersey commission are former Governor Franklin Murphy, Thomas W. Lamont, T. A. Adams, Morris Rachlin, Theodore Boettger, William H. Noyes, A. H. Allen, Palmer Campbell, J. H. Wells and Thomas N. McCarter, president of the Public Service Corporation of New Jersey, as member at large. The members of the New York commission are George R. Dyer, E. W. Bloomingdale, McDougall Hawkes, Alexander J. Shamberg and Bridge Commissioner F. J. H. Kracke. Mr. Noyes was made chairman of the New Jersey Commission on June 13.

The commission is known as the Hudson River Bridge & Tunnel Commission. The question of bridges will be considered, but it is thought that both the New Jersey commission and the New York body will favor tunnels. The plan is to have tunnels accommodate vehicles and foot passengers. The proposal to have tracks in the roadways over which passenger cars may go will also be considered. It is understood that the commissions will report to the Legislatures of the two States at their next sessions.

As noted in the ELECTRIC RAILWAY JOURNAL of April 14, page 705, the Public Service Corporation of New Jersey recently spent $75,000 in an independent survey of its own to determine, as near as might be in advance, whether the construction and operation of a vehicular tunnel would be commercially practicable.

Pacific Electric Railway Problems

C. H. Burnett, resort and real estate manager of the Pacific Electric Railway, Los Angeles, Cal., addressed the Chamber of Commerce of Venice recently. His subject was "Electric Railway Problems." While his remarks dealt directly with the Pacific Electric Railway, much that Mr. Burnett said applies to many of the other electric railways in California and to not a few properties elsewhere in the country. In discussing the magnitude and extent of the system with which he is associated the speaker said:

"The Pacific Electric Railway operates more interurban cars than are operated in the States of Ohio, Michigan and Indiana combined; runs more trains to Pasadena alone than are operated out of the great trolley center of Indianapolis on all interurban lines in all directions; and the daily interurban train departures from Los Angeles, a city of about 600,000 inhabitants, are greater than the combined train departures from nine important trolley centers of the Middle West, including the cities of Toledo, Detroit, Cleveland, Indianapolis, Dayton, Fort Wayne, Columbus, Springfield and Chicago, with a total population of more than 5,000,000."

SERIOUS FINANCIAL SITUATION

Mr. Burnett next took up the question of finances. In this connection he said:

"If any of you will examine the sworn statements of the electric railways of California on file in the office of the Railroad Commission, you will find that the electric railways of this State are facing a most serious situation, and the Pacific Electric Railway is no exception to this rule. Although our company has invested many millions of dollars in the development of southern California, we have never paid a dividend, and for the last four years our earnings have not even been sufficient to pay interest on the investment, meaning interest on the money actually put into the property and properly chargeable to capital account under the Interstate Commerce Commission classification. The year 1912 was the last year in which our net earnings equalled our interest and fixed charges. For the year 1913 there was a deficit of $364,000 and during each succeeding year this deficit has grown steadily greater until for the single year 1916 it amounted to $982,000, and for the first three months of 1917 it has already equalled $432,000 or at the rate of nearly $1,750,000 for this year."

The causes that Mr. Burnett ascribed for this remarkable condition were the fifty-four different varieties of franchises of the company, many with requirements that have become unnecessary, unjust and exceedingly burdensome, unjust paving charges, unnecessary stops, high cost of material and supplies, radical changes in both freight and passenger motor vehicles and unjust taxation. He cited some of these iniquities in detail. In conclusion Mr. Burnett said:

"I have ventured to point out to you the difficulties under which the electric railways are laboring, in the hope that you will aid us, as opportunity offers, in securing a square deal, and when I say a square deal I mean not only a square deal for the Pacific Electric Railway and its 5000 employees and a square deal for the other electric lines and their thousands of employees throughout the State, but also a square deal for the public and especially for southern California, whose future is so intimately connected with the prosperity of the electric railways, just as its past has been so closely interwoven with their activities and development. Although we are keenly alive to the seriousness of these problems, we are facing them hopefully, optimistically, and with a firm confidence in the ultimate fairness and justness of the thinking public, in whose hands we cheerfully leave our case. Whatever the verdict may be, we will try to meet it with a smile."

Cyclone Hits Michigan Line

The Detroit, Jackson & Chicago Railway, operated by the Detroit (Mich.) United Lines, between Detroit, Jackson and Kalamazoo, was hard hit by a cyclone which swept through a path 2½ miles in width between Ann Arbor and Chelsea on June 6. Poles were snapped in two and much overhead ruined. The tracks were covered with telephone, telegraph and trolley poles, as well as wreckage from fences, barns and houses. Service was completely blocked between Ann Arbor and Chelsea for twenty-three hours. Heroic work was done by the big gangs of laborers, linemen and other employees of the power, track and operating departments. These men worked without rest for twenty-four hours cleaning up the wreckage, digging post holes, putting up new poles, stringing new wire, etc. Gasoline hand cars were used to carry poles and distribute them along the tracks. Sandwiches, coffee, hard-boiled eggs, etc., were distributed by auto to the workers along a stretch of track 2½ miles in length. Every man stuck to the job until the line was reopened for regular service.

Toledo Times Returns to Attack

The proposed plan of municipal ownership of the street railway in Toledo, Ohio, has been condemned editorially by the Toledo *Times*, which says that it would be unfortunate to engage in such an enterprise at the present time. Successful investors do not buy when prices are at top notch, but when prices are right. The paper states that should the city buy the property the coming fall at the market, pledging the credit of the municipality to complete the deal, as now proposed, it will condemn the patrons of the road to a high rate of fare for all time. The rate of fare must be based on fixed charges and cost of operation. Interest on the bonds will necessarily be heavy, since the high prices of all materials will of themselves mean a high price for the property. The *Times* said further:

"No man of sound mind will claim that a politically managed property can be conducted as economically as a privately controlled property. With both fixed charges and operating expenses heavily increased, the car riders would have as much show for low fares as the people of Toledo had for 'free gas' when they embarked on the lamentable enterprise of the city pipe line. Present conditions are bad enough, but that is no reason why they should be made worse. The people elected Milroy as Mayor. Milroy named the 'car commission' and the 'commission' has put us in a hole. But we won't help matters by digging the hole deeper. The problem is to get out and stay out."

Oakland Resettlement Franchise

The advisory committees of seven members each appointed by Mayor Davie of Oakland and Mayor Irving of Berkeley, together with the five newly-elected members of the Alameda Council, headed by Mayor Greene Majors, and also City Attorneys Morf and Stringham, conferred with representatives of the San Francisco-Oakland Terminal Railways, Oakland, Cal., at Mayor Davie's office, on May 14 and 21. Mayor Davie was also present.

Upon request of the advisory committees, the company submitted a skeleton form of resettlement franchise. This suggested form was the subject of discussion at the meetings. The discussions have been on broad lines and so far have been confined in a general way to the main features of the proposed resettlement franchise; to wit, certain legal questions, depreciation and the powers of the proposed boards of control, which boards are to consist of two members—one representing each of the cities interested and the other the railway company. It is proposed to hold regular meetings every Monday evening, and each and every detail will be carefully worked out so as to harmonize all legal, financial or operative problems.

In commenting on the conferences *Key System News*, published by the company, said:

"It seemed to be the opinion of all committeemen present at these meetings that if sufficient time is given to a careful study of the situation the result would be the drafting of a resettlement franchise that would be fair to the public, fair to the railway company, and that would insure the proper city transportation facilities through the rehabilitation of the street railway company's property and equipment."

Governor Stephens has signed Senate bill 534, commonly known as the resettlement franchise bill. This bill was introduced into the Legislature and passed unanimously, and was intended to smooth out some possible legal obstacles.

Estimates of Extensions Under Way

The City Council of Seattle, Wash., has passed a resolution introduced by Councilman Oliver T. Erickson, calling upon the city engineer to obtain estimates on the cost of extending and connecting the municipal lines. The vote was unanimous, but Councilman Hanna qualified his vote by the statement that his support of the resolution was not to be interpreted to mean that he would vote for an ordinance authorizing the extensions. He stated that he desired to obtain figures showing what would be the possible income to the city from the enlarged street railway system.

The city utilities department is now preparing figures of cost. The city engineer will furnish estimates of the cost of a double-track steel elevated railway with rails and single trolley on Washington Street, running from Fourth Avenue South and Washington Street to the terminus of the Port Belt line at Washington Street and Railroad Avenue; and of a double-track steel trestle with rails and single trolley to be built from Railroad Avenue and Washington Street south to Spokane Street over the Port Belt line, as near as practicable, then west to connect with the new Spokane bridge and the Lake Burien municipal car line. The resolution originally called for a wooden trestle on Washington Street, but when it was pointed out that steel must be used at this point, unless the building code enacted by the Council is to be violated by the city, the resolution was changed calling for estimate on steel construction.

A resolution was also adopted directing the Board of Public Works to build a double-track car line and trolleys on the proposed higher level bridge across the West Waterway at West Spokane Street.

Renewal of Negotiations Likely

St. Louis Conferences on Mill Tax and Other Matters Will Probably Be Resumed Soon

It was stated recently by Mayor Kiel of St. Louis, Mo., that on June 15 he would send a special message to the Board of Aldermen, asking the members to appoint a committee of three who with the Mayor and City Counselor shall be authorized to take up the existing controversy with the United Railways over the mill tax. The Mayor explained that the committee of public utilities of the board, which is composed of seven members and to which had been assigned the disposal of the mill tax controversy, was too unwieldy. He thought that a smaller body could handle the work more expeditiously. Owing to the fact that legislative action will be required to effect the settlement it will be necessary to have an aldermanic committee in the conference. The addition of the City Counselor to the committee is to have him take care of the legal phases of the compromise if one is reached.

On Nov. 22, 1916, the United Railways made substantially the following proposal to the city: The company would agree to accept liability for the mill tax up to Dec. 31, 1916, the amount to be paid in equitable annual installments, provided that the city would agree to substitute a new tax bill based on the operating conditions of the company at present, agree to withdraw its attack on the validity of the underlying franchises of the company and extend all the present franchises to April 12, 1948.

An informal proposal has also been made by the company to permit the city to have an interest in the company somewhat after the method in use in Chicago.

Murray Carleton, A. L. Shapleigh and Richard McCulloch were some time ago designated by the directors to represent the company in the negotiations with the city.

Denver Brotherhood Pledges Loyalty

Certain of the men in the employ of the Denver (Col.) Tramway who, as a committee of the employees, presented an agreement to the management on June 4 making demands for higher wages and a ten-hour work day later repudiated the action after they had discussed the situation with F. W. Hild, general manager of the company. The statement of the members of the committee whose names were on the demands was as follows:

"We, the undersigned committee, appointed to represent the Amalgamated Association of Street & Electric Railway Employees, find that matters are not as represented and hereby advise our fellow workmen and trainmen not to attend any meetings called for the purpose of organization, but we do believe that all these matters can best be handled through our own brotherhood. We have resigned from the committee."

The brotherhood of employees of the company, organized some time ago, will appoint a committee which will take up the matter of wages with the management. This is in accordance with a plan formerly decided upon, to which program the members of the union committee previously mentioned is now committed. On June 5 nearly 500 members of the brotherhood passed a resolution repudiating the action of the committee of five. This resolution, except for the abstract which it contained from Article I of the by-laws of the brotherhood relating to the purposes of the brotherhood, follows in full:

"Whereas, a committee claiming to represent the employees of the Denver Tramway waited upon F. W. Hild, general manager of said company, on June 4 and at said time submitted a set of demands upon the company, signed by said committee, and outsiders having no connection whatever with the company,

"And whereas, the said committee were not authorized to represent the employees of the company or the members of the Tramway Brotherhood:

"Now, therefore, be it resolved by the trustees and members of the Tramway Brotherhood of Denver, all employees of the Denver Tramway, in this meeting assembled, that the aforesaid action of this committee was entirely without warrant or authority.

"Further resolved, that we do hereby reaffirm our allegiance to said brotherhood and particularly the purposes and objects thereof as set forth in Article I of the by-laws.

"Further resolved, that we believe the members of said committee acted under a misapprehension of the facts, and we hereby approve their resignation from said committee.

"Further resolved, that a copy of these resolutions be sent to the Denver Tramway and the press of the city."

On the brotherhood board which will deal with the company are one man from each of the seven divisions and three from the major departments.

Chicago Wage Situation

Friendly negotiations are being continued by the officers of the Chicago Surface Lines, the Chicago Elevated Lines and the representatives of the respective unions looking toward an agreeable settlement of the wage question. William D. Mahon, president of the Amalgamated Association of Street & Electric Railway Employees, is in Chicago to help with the situation. The president of the elevated union is quoted as having said:

"I don't believe there will be any sort of settlement in less than a couple of months' time. There is no strike spirit in the conference which our union has held with Mr. Budd. Mr. Budd has always been courteous and open-minded."

Chicago Bills Before House Committee

Walter L. Fisher, special counsel for the local transportation committee of Chicago, was cross-examined on the Chicago traction situation during the principal part of a three-hour session of the House committee on public utilities of the Illinois State Legislature on June 12. Action of the committee was postponed until the following night. The principal questions directed at Mr. Fisher concerned the connection of Samuel Insull with the bills. Mr. Fisher said that in his judgment Mr. Insull's attitude was that of willingness to go along as a factor in the general adjustment of the traction situation, and that he did not care whether the bills were passed. Mr. Fisher expressed the opinion that in case the bills were passed and ordinances were adopted by referendum vote the solution of the situation would be a purchase of the elevated lines by the surface lines. Under such an arrangement Mr. Insull would be able to protect his existing power contract with the lines.

Hazleton Line Increases Wages.—The conductors and motormen on the Wilkes-Barre & Hazleton Railway, Hazleton, Pa., have received a voluntary wage increase of 1 cent an hour for a nine-hour day.

Jurisdiction of Public Service Commissions Extended.—Governor Whitman of New York has signed the Machold bill giving the Public Service Commissions jurisdiction over navigation companies, transportation companies and common carriers by water.

B. R. T. Gets Court Order in Car Case.—The Brooklyn (N. Y.) Rapid Transit Company has obtained from the courts a writ of certiorari for the review of an order issued to it last December by the Public Service Commission for the First District of New York to buy 250 extra cars for use on the surface lines of Brooklyn.

New Kentucky Board.—A new law has been enacted in Kentucky creating a Board of Tax Commissioners. The members of this commission have not yet been appointed, but when the appointments have been designated the members will organize and then take over the work performed by the former Board of Assessment and Valuation.

Progress of East St. Louis Arbitration.—C. E. Smith, representing the East St. Louis & Suburban Railway, East St. Louis, Ill., on the arbitration committee, and Al Towers, who is looking after the interests of the employees on the committee, are holding daily conferences. Thus far they have not progressed to that point where a third arbitrator can be called in. Just as soon as the two representatives have arrived at the point where a third party will be of assistance in settling the matters before them one will be named.

Governor Signs Car Capacity Bill.—The Governor of New York has signed the bill under which the Public Service Commissions receive power to fix the maximum number of passengers that may be carried on a street car in any city of more than 450,000 population. The lodgment of this specific authority solely with the commissions is the outcome of the attempt made by the Board of Health of New York City, under the wide power which it enjoys, to impose car-carrying capacity rules upon certain car lines in Greater New York.

Recruiting in New York.—Alexander J. Hemphill of New York City's committee on national defense has asked for 2000 volunteers among those who have worn their country's uniform to stimulate recruiting for all branches of the service. The men will be organized in squads of five to twenty men to address and give out information to audiences throughout the city. Volunteers are requested to send their addresses to the secretary with an offer of service of one night each week in the recruiting battalion, whose headquarters are at 50 East Forty-second Street, New York.

Extension Order Upheld by Supreme Court.—The Supreme Court of the United States on June 11 upheld the order of the Public Service Commission of Washington requiring the Puget Sound Traction, Light & Power Company to improve the street railway service on several lines in the city of Seattle. The company appealed on the ground that two of the lines involved, which run over tidal marshes to the beaches, were unprofitable. The majority of the Supreme Court held this not to affect the question, so long as the entire system was profitable. Justices White, McKenna and McReynolds dissented.

I. C. C. Rate Hearings Ended.—Hearings on the application of the railroads of the country for a 15 per cent horizontal raise in freight rates were closed on June 12 by the Interstate Commerce Commission. The carriers have rested their case on the statement that increased labor costs, due to the Adamson law, and higher costs of materials, fuel and supplies, have created an emergency. Shippers have submitted data designed to show that the earnings of the roads are on an increase, and that the year 1917 will be the best in history, except 1916, which was the peak period of railway earnings, and admitted to be abnormal.

Board Establishes Responsibility for Accident.—A board of arbitration sitting for the Pacific Gas & Electric Company and the company's street railway employees at Sacramento, Cal., in a case involving the discharge of a motorman for alleged negligence, has decided that the motorman be reinstated and paid back salary amounting to $1,107. Lafayette Derr, the motorman, was discharged a year ago last May after a collision between his car and a buggy. His fellow employees claimed that he had been discharged after an incomplete investigation. The company, desiring fully to protect the employees from any possible injustice, agreed to arbitrate. The board consisted of Judge John C. March, representing the employees, J. L. Nagle, representing the company, and T. D. Littleton, selected by Messrs. March and Nagle.

Franchise Tax Illegal.—The Louisville & Interurban Railroad and the Louisville Railway on June 11 won an appeal in the Supreme Court of the United States to prevent the Kentucky Board of Assessments from imposing a franchise tax for the year 1915 at a rate of assessment higher than that imposed on other classes of property in the State. Justices Holmes, Brandeis and Clarke dissented. Bases of assessment for railroad property, which the roads claim to be too high, were involved in the suit. Emphasis was laid in the opinion of the Supreme Court on the fact that the tax assessments on the property of the public service corporations in Kentucky are fixed by the Railroad Commission, while another body assessed all other property for taxation. In the case of the public service corporations property was assessed at 75 per cent of full value. In all other cases the property was assessed at only 52 per cent.

Controversy on San Francisco Crossing Maintenance.—The United Railroads, San Francisco, Cal., has served notice on the contractor installing the tracks on which the Municipal Railway will parallel the private company's Market Street lines that he must have the company's permission to install the several crossings where the Municipal lines cross those of the United Railroads. The private company points out that the California Railroad Commission has ruled that a railway which desires to cross the tracks of another company must put in the crossing and maintain it at its own expense. On this ground the company declares that the Municipal Railway must bear the installation and maintenance cost of the new crossings. The city attorney, on the other hand, takes the stand that the Municipal line, not being subject to control by the Railroad Commission, is not liable for this charge and proposes that the United Railroads assume half the expense of maintaining the crossings.

Washington State Valuations.—According to figures compiled by the State Tax Commission of Washington the valuations of both electric and steam railroads have decreased. Steam roads have a total valuation of $341,132,897 in 1917 compared to $341,917,929 in 1916, while the valuation of the electric roads has decreased from $45,462,600 in 1916 to $44,626,975 in 1917. The lower valuations are attributed to the fact that neither the steam nor the electric roads have added appreciably to their stock and equipment during the last twelve months, while the usual depreciation has taken place. Of the electric roads, the Puget Sound Traction, Light & Power Company valuation remains the same at $18,681,600. On the other hand, the valuation of the Tacoma Railway & Power Company is cut from $3,600,000 to $3,450,000 and that of the Puget Sound Electric Company of King and Pierce Counties from $3,000,000 to $2,800,000. The valuation of the Olympia Light & Power Company remains the same at $330,000.

Program of Association Meeting

New York State Convention Abandoned

The June convention of the New York Electric Railway Association, arranged to be held at Bluff Point, N. Y., on June 26 and 27, will be omitted this year. There will be a business meeting of the association, however, at the Hotel Astor, New York, on June 27 at 10.30 a. m. for the election of officers and the transaction of other important business.

Financial and Corporate

Annual Reports

New Orleans Railway & Light Company

The comparative income statement of the New Orleans Railway & Light Company, New Orleans, La., for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Operating revenue	$7,200,740	100.00	$6,951,587	100.00
*Operating expenses	3,603,859	50.06	3,410,773	49.06
*Net operating revenue	$3,596,881	49.94	$3,540,814	50.94
Revenue deductions — taxes, etc.	781,841	10.84	776,077	11.17
*Net operating income	$2,815,040	39.10	$2,764,737	39.77
Miscellaneous income and outside operations	68,391	0.95	55,243	0.79
*Gross income	$2,883,431	40.05	$2,819,980	40.56
Income deductions—interest, etc.	1,907,196	26.49	1,817,987	26.15
Net income before deducting charges for renewals and replacements	$976,235	13.56	$1,001,993	14.41
Charges for renewals and replacements	255,883	3.55	212,927	3.06
†Net income	$720,352	10.01	$789,066	11.35

*Not including charges for renewals and replacements shown below.

†This amount before distribution, subject to a deduction of $16,666 per month, from June 1, 1916, as an additional reserve for repairs, maintenance, and renewals and replacements.

The gross operating revenue of the company increased $249,153 or 3.58 per cent in 1916 as compared to 1915, while the operating expenses rose $193,086 or 5.66. As a result, the net operating revenue gained $56,067 or 1.58 per cent. After higher payments for taxes and interest and larger charges for renewals and replacements, the net income showed a falling off of $68,713 or 8.71 per cent.

The decrease in net income was mainly caused by the reduction in electric rates, which became effective on Dec. 1, 1915, and the increased cost of materials and wages. On May 29, 1916, a jitney ordinance became effective, as a result of which the jitneys practically ceased to operate and the railway earnings increased. The large share of the railway department in the gain in net operating revenue is shown below:

	1916	1915	Increase	Per Cent
Operating revenue:				
Railway department	$4,422,777	$4,198,235	$224,542	5.35
Electric department	1,433,814	1,489,015	*55,200	*3.70
Gas department	1,344,149	1,264,337	79,811	6.32
Total	$7,200,740	$6,951,587	$249,153	3.58
Operating expenses:				
Railway department	$2,437,364	$2,342,411	$94,953	4.05
Electric department	635,359	573,406	61,952	10.70
Gas department	531,136	494,956	36,181	7.32
Total	$3,603,859	$3,410,773	$193,086	5.66
Net operating revenue	$3,596,881	$3,540,814	$56,067	1.58

*Decrease.

In 1916 the company carried 87,680,288 revenue passengers as compared to 65,021,214 in 1915, with transfer passengers of 25,173,015 and 6,641,193 in the two years respectively. The percentage of passengers using transfers increased from 10.2 per cent in 1915 to 28.7 per cent in 1916, while the average fare per passenger dropped from 4.57 cents to 3.88 cents. The car mileage in 1916 was 19,933,702 and in 1915 it was 16,753,874.

The actual charges for maintenance during the year amounted to $775,598. In addition to this amount, there was expended $354,378 for renewals and replacements, making a total charge for maintenance and renewals and replacements of $1,129,976. There was reserved from income and surplus for renewals and replacements, $372,549, resulting in a net credit to renewal and replacement reserve for the year of $18,171. A total of $726,433 was expended for improvements and betterments during 1916.

Milwaukee Electric Railway & Light Company

The comparative income statement of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., for the years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Operating revenues—railway	$4,612,397	66.2	$3,911,942	65.6
Operating revenues—light, power and steam heat	2,348,754	33.8	2,059,773	34.4
Total operating revenues	$6,961,151	100.0	$5,971,715	100.0
Railway operating expenses:				
Way and structures	$209,985	3.0	$181,856	3.2
Equipment	200,496	2.9	206,541	3.4
Traffic, power, transportation	1,704,279	24.6	1,461,951	24.5
General	139,251	2.0	139,890	2.3
Undistributed	328,540	4.7	259,491	4.3
Depreciation (reserve credit)	593,091	8.5	465,679	7.8
Contingencies (reserve credit)	1,000	0.0	......	...
Taxes (reserve credit)	289,738	4.1	277,018	4.6
Total railway operating expenses	$3,466,480	49.9	$2,992,426	50.1
Operating expenses—light, power and steam heat	1,464,844	21.0	1,172,455	19.7
Total operating expenses	$4,931,324	70.9	$4,164,881	69.8
Net operating revenue	$2,029,827	29.1	$1,806,834	30.2
Non-operating revenue	77,173	1.1	29.321	0.5
Gross income	$2,107,000	30.2	$1,836,155	30.7
Income deductions	759,393	10.9	793,570	13.3
Net income	$1,347,607	19.3	$1,042,585	17.4
Dividends on preferred stock	$270,000	3.8	$270,000	4.6
Dividends on common stock	1,058,875	15.2	763,375	12.7
Surplus	$18,732	0.3	$9,210	0.1

The operating revenues for 1916 showed an increase of $989,436 or 16.57 per cent as compared to those of the preceding year. The operating expenses, however, rose $766,443 or 18.4 per cent, so that the net operating revenue gained $222,993 or 12.3 per cent. Owing to a large gain in non-operating revenue, and also a substantial decrease in income deductions, the net income for the year showed an increase of $305,022 or 29.2 per cent.

The increase in the operating revenues of the railway department was $700,455 or 17.91 per cent. This gain was partly due to a substantial reduction in jitney operation and partly to the intense industrial activities generally prevailing throughout the country. The increase in operating expenses was $474,054 or 15.8 per cent. The light, power and steam-heat revenues gained $288,980 or 14.03 per cent. For the whole company, the higher cost of materials and labor, and the larger reserve for depreciation and taxes, absorbed 77 per cent of the increase for the year in operating revenues.

The appropriations for maintenance and depreciation included in operating expenses were equivalent to the following percentages of the operating revenues of the respective departments: Electric railway department, 22.25 per cent; electric light and power department, 18 per cent; and steam-heating department, 12 per cent.

During 1916 there was expended for additions and betterments the sum of $1,005,631, of which $506,125 was chargeable to the railway, $439,401 to the electric utility and $60,104 to the heating utility. The value of property replaced or abandoned and charged to the depreciation reserve during the year was $153,971.

The Employees' Mutual Savings, Building & Loan Association continued to show substantial growth. At the end of the year the employees had subscribed to $2,613,300 par value of stock of the association and had borrowed on first-mortgage loans $277,650. The last year showed the largest rate of growth in the history of the association, stock subscriptions having increased $1,331,000 or 104 per cent and mortgage loans $139,350 or 101 per cent.

Miscellaneous statistical data of the company follow:

	1916	1915
Receipts per mile of track operated	$25,594.57	$21,698.05
Revenue passengers carried	107,528,091	91,400,946
Transfer passengers carried	44,655,506	37,868,654
Per cent of transfer to revenue passengers	41.54	41.43
Receipts per revenue passenger	$0.0425	$0.0424
Revenue car-hours operated	1,772,573	1,613,680
Receipts per revenue car-hour	$2.60	$2.42
Revenue car-miles operated	15,889,284	14,323,343
Receipts per revenue car-mile	$0.2901	$0.2731

$23,000,000 Additional Needed

Original Estimate of $22,459,893 for Subway Equipment Material, Made in 1913, Has Expanded to $44,827,327, Due to Rising Costs

An application was filed on June 13 by the Interborough Rapid Transit Company with the Public Service Commission for the First District of New York for authority to issue an additional $25,483,772 of 5 per cent bonds under its first and refunding mortgage of $300,000,000, dated March 20, 1913. The appeal to the commission shows that the total estimated cost of the equipment provided for in the dual system contracts is $44,827,327. The original estimate made in 1913 was $22,459,893. The difference is accounted for by the general statement that it represents the increases in the cost of labor and material, and covers also some additional work that was not contemplated when the preliminary estimates were made.

Of the proposed new issue $23,827,327 is to be used to pay for the cost of equipment and the remaining $1,656,445 is to meet the expenses of the sale of the bonds at the proposed price of 93½, and to take care of any discount or deficiency in the amount realized. The figures show that $6,371,631 had been spent for equipment up to Dec. 31, 1916. Among the large expenditures yet to be made the table shows $1,312,000 for tunnels, $3,371,000 for interlocking and other signal apparatus, $2,301,000 for a transmission system, $5,585,000 for a distribution system, $1,467,000 for stations, waiting rooms and other buildings, $3,870,000 for substation equipment, $7,581,000 for cars, $3,388,000 for electrical equipment of cars, and $3,300,000 for interest during construction.

The commission will hold a public hearing on the application on July 9.

As noted in the Electric Railway Journal of March 24, page 567, the company some time ago applied to the commission for $16,436,090 additional to provide for the completion of work estimated in January, 1913, to cost $26,953,702. Early in the present month the commission authorized the company to sell $11,436,000 face value of 5 per cent bonds under the application just noted. The commission, however, withheld its approval of $5,000,000 of the total sum for reasons advanced at length in its opinion on the case.

Frisco Reorganization Approved

Capital to Be Reduced from $84,639,100 to $47,011,100—Total Annual Interest Charges Will Be Cut $343,890

The amended plan of reorganization of the United Railroads, San Francisco, Cal., dated April 26, 1917, has been declared operative, the holders of more than $20,500,000 of the 4 per cent bonds due in 1927 having assented to it. Notice to this effect was given on June 9 by the committee of holders of the 4 per cent bonds, of which John Henry Hammond of Brown Brothers & Company, New York, N. Y., is chairman. Further deposits will be received without penalty at the office of the Equitable Trust Company, New York, N. Y., or the Union Trust Company, San Francisco, Cal., on or before June 24. After that date such bonds as the reorganization committee may accept will be charged $20 a bond.

Two committees sought deposits of the 4 per cent bonds of the company. Later these committees reached a tentative understanding in regard to the reorganization. The proposal is to reduce the capitalization from $84,639,100 to $47,011,100. The amended plan for readjusting the finances of the company provided as follows:

First, for the cash requirement of $5,200,000 to take care of underlying bonds overdue and to mature on April 1, 1918; second, for the exchange of the present 4 per cent bonds for new securities, consisting of 66 2-3 per cent of the holdings in new 6 per cent bonds, 8 1-3 per cent in first preferred stock and 33 per cent in new common stock; third, for the retirement of $45,873,000 in outstanding notes, preferred stock and common stock, by an issue of $12,244,000 of new second preferred and common stock, and, fourth, for salable securities to take care of the company's future capital requirements.

The $5,200,000 cash requirement is provided for as follows: $2,200,000 by the use of income accumulated pending reorganization and the sale of some non-operative property and $3,000,000 by the sale of Market Street Railway 5 per cent bonds. This leaves the Market Street Railway 5 per cent bonds as the only underlying bonds and reduces the total underlying amount to $10,098,000. Under the terms of the Market Street Railway mortgage, $3,909,000 is reserved for future improvements.

For all the junior issues the plan provides $6,000,000 of second preferred stock and $6,244,000 of common stock. In addition, the junior security holders are required to purchase $3,000,000 of Market Street Railway 5 per cent bonds, to be issued to retire underlying bonds at par, for $3,000,000 cash.

The fixed interest on the new 6 per cent bonds is exactly equal to the 4 per cent interest on the par of the present bonds, and the interest return to the bondholders is left unchanged. The total interest bearing debt of the company is reduced by the plan $12,959,000. The total annual obligatory charges are reduced $343,890. The total annual interest charges under the new plan will be $1,444,860.

Sale of Northern Electric Unlikely

As stated previously in the ELECTRIC RAILWAY JOURNAL, the amended plan of reorganization of the Northern Electric Railway, Chico, Cal., has been declared operative. Closely following this announcement the statement was made that representatives of the Western Pacific Railway told the reorganization committee that their company was prepared, if the California Railroad Commission should approve, to enter into negotiations for the purchase of the Northern Electric Railway. According to the San Francisco *Chronicle* these negotiations have been called off, for the present at least. That paper said recently:

"All negotiations between the Western Pacific Railway and the reorganization committee of the Northern Electric Railway for the purchase of the Northern Electric's properties by the Western Pacific are off, at least for the present. It was announced that at a meeting of the reorganization committee the sub-committee appointed to consider the proposition reported that 'after a thorough consideration of the subject, they had concluded that the reorganization committee was not in a position at the present time to accept or reject any offer, nor could it enter into any agreement for the sale of the properties, and they therefore deemed it inadvisable further to negotiate at this time.'

"The committee recommended that the foreclosure proceedings be carried through at once and that the properties be purchased at the foreclosure sale, and that when the reorganization had been completed the negotiations with the officials of the Western Pacific Railway for the sale of the properties be resumed.

"The recommendations of the sub-committee were unanimously approved by all the members of the reorganization committee, and the attorneys were directed to take steps to obtain decrees of foreclosure of the various bond mortgages as soon as possible."

Oklahoma Valuations Fixed

Assessments for taxation purposes have been fixed for many of the street railway and interurban lines in Oklahoma. In most cases the figures are higher than the valuations fixed last year. The Board of Equalization is following a new plan in making assessments this year. It is taking for purposes of taxation the valuations as certified by the various corporations to the Corporation Commission for rate-making purposes. The traction interests have protested against this. They maintain that the actual investment and other values on which rates should be based can not be taken as the real value on which values for taxing purposes should be based. Valuations so far fixed by the State Board of Equalization are as follows: Bartlesville Interurban Railway, $275,000; Guthrie Street Railway, $25,000; Oklahoma Street Railway, Oklahoma City, $3,115,000; Sapulpa Electric Interurban Company, $125,000; Shawnee-Tecumseh Traction Company, $100,000; Tulsa Street Railway, $325,000; Union Traction Company, Tulsa, $225,000; Enid City Railway, $230,000; Ardmore Street Railway, $22,500; Capital Traction Company, Oklahoma City, $8,000; Chickasha Street Railway, $37,500; Pittsburg County Railway, McAlester, $629,061; Fort Smith Light & Traction Company, $30,206; Lawton Railway & Lighting Company, $42,000; Muskogee Electric Traction Company, $385,000.

Returns for Nebraska Lines

The gross earnings from operation of electric railways in Nebraska for the year ended June 30, 1916, totaled $3,931,736, as compared to $3,742,703 in the preceding year. Operating expenses increased from $2,149,140 to $2,345,727. The income from operation before interest and taxes decreased slightly, from $1,664,126 to $1,660,000. The dividend payments fell off from $557,812 to $503,298, and no reservation was made for depreciation as compared to $2,812 in 1915 and $294,605 in 1914. Only $3,399 was expended for additions and betterments in 1916. The number of revenue passengers rose from 67,288,561 to 68,432,670, while the revenue car-miles increased from 13,174,366 to 13,371,074.

Bristol (Tenn.) Traction Company.—Judge McDowell has refused the application to have the Bristol Traction Company wound up in the bankruptcy court, leaving it in the hands of the receivers, Fred D. Dulaney and Joseph A. Caldwell, to be disposed of under the direction of the State courts. Receiver Caldwell is reported to have said: "The property will be sold at an early date for the benefit of the bondholders, as it was found impossible for the company to pay its interest on the bonds. The stock will probably be a total loss. This is one among many of the small traction companies which have been put out of business by the jitneys and the automobile business and it is doubtful if Bristol will have an electric railway much longer."

Central Arkansas Railway & Light Corporation, Hot Springs, Ark.—The Central Arkansas Railway & Light Corporation, by appropriate action by its directors and stockholders, has reduced the authorized capital stock from $10,500,000 to $4,000,000, of which $1,500,000 is preferred and $2,500,000 common. There is now issued and outstanding $1,200,000 of 7 per cent preferred stock and $2,500,000 of common stock. The reduction in authorized capital does not affect the present issues outstanding. The Federal Light & Traction Company owns all the outstanding common stock.

Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio.—The properties of the Cincinnati, Dayton & Toledo Traction Company, according to a statement issued by the bondholders' committee, will be sold under foreclosure proceedings at public auction on June 30. The sale will be made subject to the underlying mortgage bonds, of which there are $2,300,000 outstanding. Bidders, therefore, will be required to bid for the equity over and above that amount.

Cincinnati, Milford & Loveland Traction Company, Cincinnati, Ohio.—On application of B. H. Kroger as a judgment creditor, C. C. Harris, president of the company, was appointed receiver of the Cincinnati, Milford & Loveland Traction Company by the Common Pleas Court at Cincinnati on June 7. Mr. Kroger had first secured a confessed judgment for $28,600 on notes for $25,000 and $2,500, both given on Dec. 29, 1914, together with accrued interest. The company operates between Madison and Blanchester. He contended that the road was so encumbered that the rights of creditors and stockholders could only be protected by a receivership. The company's trouble dates from the flood three years ago, when damages amounted to $35,000 or $40,000. Mr. Kroger is reported to hold a considerable amount of the stock of the company.

Cities Service Company, New York, N. Y.—Requests have been made to Henry L. Doherty & Company, fiscal agents of the Cities Service Company, for a reduction in the par value of the stock, the listing of the stock on the New York Stock Exchange and the granting to the stockholders of the first opportunity to supply additional capital. It is understood that all these matters were discussed at a non-official meeting of the board of directors on June 8. While no action was taken on any of them, the questions will come up for consideration at the regular meeting of the board on June 20.

Georgia Railway & Power Company, Atlanta, Ga.—All of the remaining first mortgage 5 per cent gold bonds of the Blue Ridge Electric Company dated July 1, 1910, have been called for payment on July 1 at par and interest at the office of the Columbia Trust Company, New York, N. Y.

Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn.—The property of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, popularly known as the Dan Patch line, is advertised to be sold at public auction as an entirety on June 28 at Minneapolis under foreclosure of the first mortgage of 1915, pursuant to an order of the United States District Court of the Fourth District of Minnesota.

New York (N. Y.) Railways.—New directors have been elected for the Bleecker Street & Fulton Ferry Railroad, which was taken over recently by the New York Railways. They are: J. H. Campbell, H. M. Fisher, E. F. J. Gaynor, B. J. Pepperman, W. L. Pepperman, D. W. Ross, H. H. Vreeland, Frank Hedley, George Keegan, Charles E. Warren, A. C. Wigren, E. E. Starboard and W. A. Anderson.

Public Utilities Company, Evansville, Ind.—The Public Utilities Company, a subsidiary of the Union Railway, Gas & Electric Company, has filed an open refunding mortgage, securing a present issue of $3,951,000 of bonds. The Bankers' Trust Company, New York, N. Y., is trustee under the mortgage securing the issue.

Utah Securities Corporation, New York, N. Y.—The aggregate gross earnings of the operating subsidiaries of the Utah Securities Corporation increased 16 per cent and the net 21 per cent during the year ended Dec. 31, 1916. The subsidiary Utah Light & Traction Company, which operates the street railway in Salt Lake City and vicinity and leases its lighting properties to another subsidiary, secured an increase of 4 per cent in gross earnings and 9 per cent in net during the last year. The 1916 gross totaled $1,455,081, with operating expenses at $952,909, so that the net earnings amounted to $502,172. Other income totaled $365,212 and deductions $859,740, leaving a balance of $7,644. This compares with a balance of $12,262 in 1915.

Dividends Declared

Brazilian Traction, Light & Power Company, Toronto, Ont., quarterly, 1½ per cent, preferred.

Cleveland (Ohio) Railway, quarterly, 1½ per cent.

Columbus (Ga.) Electric Company, 3 per cent, preferred.

Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, preferred.

Eastern Power & Light Corporation, New York, N. Y., quarterly, 1¾ per cent, preferred.

Eastern Texas Electric Company, Beaumont, Tex., 3 per cent, preferred; 2½ per cent, common.

El Paso (Tex.) Electric Company, 3 per cent, preferred; quarterly, 2½ per cent, common.

Illinois Traction Company, Champaign, Ill., quarterly, 1½ per cent, preferred.

Manila Electric Railroad & Lighting Corporation, Manila, P. I., quarterly, 1½ per cent.

Springfield Railway & Light Company, Springfield, Mo., quarterly, 1¾ per cent, preferred.

Toronto (Ont.) Railway, quarterly, 2 per cent.

Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1¾ per cent, preferred; quarterly, 1½ per cent, common.

Union Passenger Railway, Philadelphia, Pa., $4.75.

United Light & Railways Company, Grand Rapids, Mich., quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

United Traction & Electric Company, Providence, R. I., quarterly, 1¼ per cent.

West End Street Railway, Boston, Mass., $2, preferred.

West Philadelphia (Pa.) Passenger Railway, $5.

Traffic and Transportation

Fare Hearings Begun

Middlesex & Boston's Cry for Relief Results Largely from Competition with Inexpensive Motor Vehicles

"Henry Ford has eaten into the kingdom that was supposed to be reserved for Thomas A. Edison," said A. A. Ballantine, counsel for the Middlesex & Boston Street Railway, Newtonville, Mass., at a hearing on June 11 before the Public Service Commission of Massachusetts upon the company's petition for authority to increase its rates. The company joined the ranks of higher-fare seekers following the decision of a wage arbitration board on May 1 which granted an advance of about 10 per cent in wages to union employees. The increased cost of labor and materials, together with the enormous growth in the use of private automobiles in the company's territory, has made it impossible for the company to pay even its current expenses. Irreparable injury awaits the road if the commission fails to grant early relief.

WHY AN INCREASE MUST COME

Mr. Ballantine pointed out that the forecast of the commission in its celebrated decision of 1914 which granted to the company a 6-cent fare unit has not been realized with respect to financial improvement. Following that decision, the company was able to pay 4 per cent dividends for one year; 3.25 per cent was declared for the next year, and now the dividend has been wiped out. Neither could the road pay off any of the back operating deficit or take off certain old power plant structures from its books, and it has been impossible to assign 20 per cent of the operating revenue for maintenance and depreciation as recommended. Since 1914 the cost of materials has increased at least from 25 to 100 per cent. The recent arbitration award increased wages by about $130,000 in the three years ending June 30, 1919, assuming the same service is furnished. The company no longer has any net revenue. It is planned to increase the fare unit from 6 cents to 7 cents in the cities of Newton and Waltham and to charge 8 cents in the outer suburban and rural territory traversed west of Newton Lower Falls and in the Lexington-Concord district. The company operates 130 miles of line, of which 114 miles is single track, and its average cost is $40,000 per mile, or about the same as other Massachusetts roads excepting the Boston Elevated Railway. The population of the territory served has increased since 1910 from 175,000 to 190,000. Mr. Ballantine said that the building of garages has exceeded the building of houses in the territory.

The company's total capitalization, about $5,000,000, was issued under approval of the commission or its predecessor. The road needs at least $220,000 a year more revenue at present, and the estimated increase in earnings from the proposed 7-cent and 8-cent fare units, allowing for falling off in traffic due to the higher rates, is only $120,000 a year.

CHAIRMAN OF ARBITRATION BOARD SPEAKS

Henry C. Sawyer of Woburn, Mass., chairman of the arbitration board which recently raised the wages of the employees, addressed the commission on behalf of the proposed increase. He pointed out that the evidence considered by the board in the wage case showed that the road is most efficiently managed; that its executive salaries are small to a degree of inadequacy; that no possible retrenchment appears feasible and that the administration of the company's funds is of the highest order. The arbitration board appreciated that the wage increase would strip the company of its dividends, but a majority felt that through appeal to the commission higher fares could be secured to give the necessary increased revenue. It was the intention of those making the award to establish wages on the basis of the purchasing power of 1900 wages. "The company was already shrieking for relief," said Mr. Sawyer, "but we regarded the pronouncement of the commission regarding the necessity of giving capital a living wage in the Middlesex & Boston decision as absolutely fundamental." The speaker also pointed out that the company has suffered from jitney competition, but it has lost revenue particularly through the utilization by contractors of low-priced automobile trucks in which laborers are transported to and from the job instead of by the electric railway facilities as formerly.

The hearing was adjourned to June 25 to enable the company's exhibits to be printed for general distribution.

Los Angeles Excludes Jitneys

Platform Men Help to Secure Ordinance Which Places $10,000 Bond on Each Bus and Excludes Them from Business District

At the election on June 5 the city of Los Angeles passed an ordinance to exclude the jitneys from the business center of the city. The forbidden area is bounded on the north and south by First and Eighth Streets, and on the east and west by Main, Spring, Broadway and Hill Streets. Other features of the ordinance are that in the districts which the jitneys cover they must operate every day from 6 a. m. until midnight and each bus must carry a $10,000 indemnity bond.

The success of the campaign to secure the passage of this ordinance is attributed in large measure to employees of the Los Angeles Railway, who organized 3000 strong and made a determined effort to have their side of the question generally known. The organization, known as the Co-operative Association of Los Angeles Railway Employees, was divided into ten sections, each controlled by a section executive committee, which appointed a member to serve on a central executive committee. While the ordinance was in process of formation the central committee sent out among the business men a brief statement of their side of the case. They pointed out the conditions to show why the company was hard pressed and could not meet the demands of employees for a wage increase that would correspond with the increased living expenses. The beginning of this campaign to enlighten the public on the significance of jitney competition was reviewed in the issue of the ELECTRIC RAILWAY JOURNAL for May 5, page 846.

HOW THE CAMPAIGN CONTINUED

When the ordinance was complete the original committee was supplemented by additional members and representatives of the Pacific Electric Railway, so that about 125 workers were available for making a house-to-house canvass for signatures to the initiative petition. In addition, all conductors of both railways were supplied with copies of the petition and on final count it was found that 65,000 signatures had been secured. Another circular was then given out showing that the 3000 Los Angeles Railway employees and their dependents, totaling 10,000 people, were vitally interested in the movement, that the city must depend upon street car extension and not uncertain bus business on which to build up its outlying districts, that the 400 jitney buses did not afford any certainty of service, and that the $10,000 bond for groups of buses instead of individual buses afforded practically no protection. Letters were sent to civic bodies, all of which with one exception indorsed the ordinance. Two weeks before the election a document entitled "The Deadly Parallel," comparing the initiative ordinance with the measure proposed by the jitneys for repealing present regulation, was circulated from house to house, sent to automobile owners and business men, inclosed in all correspondence from the two railway companies, and were distributed by conductors on the cars.

On the day of the election the railways declared a general holiday and, with the assistance of friendly taxicabs and private automobiles, 550 automobiles were available for bringing voters to the polls. Altogether about 1400 employees were engaged in this work. Of about 95,000 votes cast, a majority of 9981 favored the initiative ordinance to regulate jitney buses.

Seattle Fight Thickens

Traction Company Demands that the City Curb Jitneys—Suits Brought Against "Free Buses"

The Puget Sound Traction, Light & Power Company has filed with the Mayor and City Council of Seattle a general protest against the jitney as a competitor, and asserts that if the city permits the jitney buses to continue to operate in direct violation of the law, causing financial injury to the company, the city will be held financially responsible. A. W. Leonard, president of the company, made, in part, the following statement in his formal protest to the city:

"The company is operating its street railways under franchises and has given and is giving the service called for by them. There are now operating in the city more than 150 jitneys under the pretense that the law requiring the operators to execute the bond thereby prescribed is unconstitutional. The Supreme Court of the State has repeatedly upheld the law. The Superior Court, in a suit instituted by those who are now illegally operating, has again upheld the law and has dismissed their case. Notwithstanding these facts, the violators are actually operating upon the lines of the company's street railway. The city could easily stop its continuance by requiring the operators of such vehicles to produce to the police department their authority for operating."

Attorney Ralph S. Pierce for the jitney drivers said, in part:

"We are up against a law that we cannot comply with, and therefore we hold such a statute to be unconstitutional. The act says we must furnish surety bonds to indemnify persons found to have been injured by our negligence or carelessness. The bonding companies say they do not want the jitney business and refuse to issue bonds, or else they make the conditions impossible. The law compels us to give this surety or lose our cars and our livelihood, but it does not compel the bonding companies to write the bonds for us. The statute is one-sided in its operation."

In a communication to the Puget Sound Traction, Light & Power Company, answering President Leonard, Mayor H. C. Gill declared that the Police Department of the city is too small to hold up jitney drivers and require them to show the rights by which they operate. He said it would be similar to compelling the company's employees to show authority for the company operating. In his opinion the jitney fight is one to be conducted under a state statute. He regarded it as purely a company affair, not involving the public benefit, and said the company should, therefore, conduct the prosecutions.

The jitneys cannot obtain an injunction to prevent prosecution so have resorted to operating "free buses" for contributions. The company has brought action against three operators charging that they operated vehicles for hire without legal permits. According to James B. Howe, counsel for the company, other free-bus operators will be made defendants in criminal as well as civil suits under the jitney bonding law of the 1915 Legislature.

Rate Dispute in Illinois

The State of Illinois has enjoined the railroads from charging the 2.4-cent passenger rate as permitted by the Interstate Commerce Commission, and the roads have enjoined the State from prosecuting them. The State bases its right to injunction upon the decree of the Illinois Public Service Commission which permits only a 2-cent rate. The conflict between the federal and State authorities arose from the fact that the railroads charged 2.4 cents a mile between points in Illinois and St. Louis, Mo., while the rate from the Illinois side of the Mississippi River to any point in Illinois was only 2 cents a mile. St. Louis claimed this was a discrimination in favor of East St. Louis, Ill., just across the river, and the Interstate Commerce Commission ordered the railroads to make the rates uniform—either to lower them to St. Louis or raise them in Illinois.

Governor Lowden has sent telegrams to Senators Sherman and Lewis, urging them to take up the dispute with President Wilson and Attorney-General Gregory. The case is expected to afford the first definite basis for settlement of the clash between inter-state and intra-state rates.

Key Route Asks Fare Increase

Terms of Recent Strike Settlement Add $30,000 Annually to Present Operating Deficit

The San Francisco-Oakland Terminal Railways, Oakland, Cal., has filed with the Railroad Commission of California an application for an increase in rates, stating that present fares are "unduly low, non-compensatory, and confiscatory." The company says that the value of the operative property devoted exclusively to the service mentioned is $8,304,104, and that its total earnings from this source for the last sixteen months were $1,595,043. Its operating expenses and taxes were $1,336,893, leaving net earnings of $258,150. Bond interest and fixed charges are placed at $485,598, leaving a deficit of $227,447. A special charge of $237,442 for the abandonment of an old pier trestle is added to this, making a total deficit of $489,071 for the sixteen months of operation of the Key Route ferry service and local lines.

To this deficit the company states additional labor expense has been added by the terms of the strike settlement, which were reported on page 840 of the Electric Railway Journal for May 5, and which make it incumbent upon the company to employ thirty additional deck and engine-room officers, thus increasing operating expenses $30,000 a year. The arbitration board which determined the terms of the strike settlement was assisted by Judge Maurice T. Dooling, who held that the wage schedule asked by the employees should not be imposed upon the company, thereby entailing the additional expense referred to, without an application being made for a readjustment of passenger fares. It was his view, as expressed later in writing, that inasmuch as the company, and the men as well, were working for the public, if, in the interest of the men and the public whom they served it was fair to the men to give them the schedule they demanded, it was also fair that the public should compensate the company for its additional expense made necessary in the performance of its service to the public.

More Skip Stops in Baltimore

The United Railways & Electric Company, Baltimore, Md., will apply the skip stop to several additional lines. The company reached its decision to add to the number of skip-stop lines as the result of a careful study of the plan on the Edmonson and North Avenue lines upon which it has been in operation for some time. The application of the skip stop to these lines was described in an article in the issue of the Electric Railway Journal for June 2, page 992.

Officials of the company say it has been clearly demonstrated that there is a considerable saving of time, that this saving has been effected without increasing the element of danger, that a greater number of car trips can be made per day, and that the people prefer the quicker method of transportation. In support of the statement that a better service is rendered, the daily statements of the two skip-stop lines show that more than forty additional round trips are being run than formerly, and the total additional daily car-miles operated on the two lines is greatly in excess of 500.

Many letters have been sent to the Public Service Commission and to the railway company favoring and opposing the plan. An examination of these shows that 63 per cent approved the skip stop without qualification; 25 per cent approve but object to having their corner cut out; and only 12 per cent are opposed to the skip-stop principle.

L. I. R. R. Seeks City Fare Increase

A petition was filed on June 8 by the Long Island Railroad with the Public Service Commission for the First District of New York asking that the order of the commission fixing the 5-cent far on trains between Flatbush Avenue and Railroad Avenue be discontinued and that the company also be permitted to discontinue selling twenty-trip books for $1. The petition says:

"Such 5-cent fare rates are non-compensatory for the service rendered, unreasonably low, burdensome and confiscatory under existing conditions. The company prays that the order be abrogated so that the company can file a tariff to provide for a 10-cent fare between East New York and Flatbush Avenue, and Warwick Street and Flatbush Avenue and Railroad Avenue and intervening points, and to discontinue the twenty-trip books now selling for $1."

The present rate of fare was made effective following hearings held by the commission in July, 1911.

The stations mentioned are all on the electrified line of the company extending from Flatbush Avenue, Brooklyn, to Jamaica. Railroad Avenue is the last station on the line outgoing from Brooklyn within the limits of Kings County. Previous to 1911 the 5-cent fare extended only to Warwick Street. It was agreed, however, at that time that the 5-cent fare would be extended to Railroad Avenue, thus making the 5-cent fare uniform for all the stations within Kings County. It was distinctly stated then that this was in the nature of a concession on the part of the company, and that it was not to be construed into meaning that the company could further extend the 5-cent limits into Queens County. With the consent of the company the commission then entered the necessary formal order.

Why Holyoke Road Asks Increase

President Pellissier Reviews Financial Status of the Company and Suggests Remedies

In response to an invitation from the Chamber of Commerce, L. D. Pellissier, president of the Holyoke (Mass.) Street Railway, addressed the board of directors of the chamber on June 4 and set before the members the financial condition of his company. As reported in the Electric Railway Journal for June 9, page 1070, the company has applied for permission to rearrange its fare schedules to secure an increase in revenue.

Mr. Pellissier presented a very comprehensive statement by which he endeavored to show that the capital invested by the company had been wisely expended, that the property is being operated efficiently and economically, and that the gross income is not sufficient to provide for depreciation and a fair return on the investment. He said that the investment per mile of track is $9,361 less than the average of street railways in the State, as shown in the 1916 report of the Public Service Commission. A table of operating expenses per car-mile of railways in the State for the years since 1908 showed those of the Holyoke Street Railway to be less than the average. Additional gross income to the amount of $150,000 annually is necessary in order to provide a return of 6 per cent on money invested. These calculations were based on 1916 figures.

Company officials believe that an increase in compensation or a decrease in distances of travel for one fare or both will go far toward providing sufficient income for the present needs. Mr. Pellissier said he hoped the public would look favorably upon the request for more revenue.

Iron Railings Mark Safety Zones.—Municipal authorities of Oklahoma City, Okla., will install iron railings at busy corners to mark safety zones for pedestrians and persons using street cars. Since the recently enacted traffic ordinance has been in effect chalk lines have marked safety zones, but these have proved inadequate.

More One-Man Cars in Bellingham.—The Puget Sound Traction, Light & Power Company, Bellingham, Wash. has replaced the heavy two-men cars on its main line with one-man cars and is giving ten-minute instead of fifteen-minute service. One-man cars have been in use on other lines in Bellingham for some time and are giving satisfaction.

Auto Bus Company Incorporated.—An auto bus company has been formed in Fort Worth, Tex., with George H. Clifford, local manager of the Northern Texas Traction Company of that city, as manager. The new company is capitalized at $20,000 and was formed because the traction company cannot operate buses under its present charter. The buses, which will run on schedule, will furnish transportation to Lake Worth and were expected to be in operation by June 15.

One-Way Streets Authorized.—An amendment to the motor vehicle act recently passed by the California State Legislature, provides that "local authorities of any city, town, or city and county may impose additional restrictions to those herein contained applicable to vehicles exclusively used in the carrying of merchandise or articles of freight and of a carrying capacity in excess of 1 ton in weight, and may designate certain streets whereon heavily laden vehicles may be excluded or declared to be 'one-way' streets and may further restrict or prohibit the use of trailers."

Jitneys Get Restraining Order.—Chancellor Martineau has ruled that the city of Argenta, Ark., has no right to regulate the operation of automobiles engaged in interurban service and has issued a permanent restraining order enjoining the city from enforcing an ordinance which places a monthly license on jitneys operating to Fort Roots, which is beyond the city limits. The petition for injunction was filed in Chancery Court on May 18 by Thomas Keath and twenty-four operators. The ordinance exacted a license of from $4 to $12 per month on each jitney, according to its passenger capacity.

United Railways Organizes for Safety.—To make its safety work more effective than ever before the United Railways & Electric Company, Baltimore, Md., has organized a central safety committee with sub-committees in all departments and on all lines of the company. The object is to interest every employee in the safety measures of the company and to make each feel his or her responsibility in this work. M. J. McDonough, heretofore assistant traffic manager, has been appointed chairman of the committee on safety work and will devote his entire time and attention to this matter. The safety committee's activities will be extended to the public through an educational campaign for disseminating the safety doctrine.

New York & North Shore Wants 7 Cents.—The New York & North Shore Traction Company, Roslyn, N. Y., has taken steps to obtain permission to increase its fares from 5 cents to 7 cents. It declares that the present 5-cent fare is insufficient. An increase of 2 cents in the fare, it is said, would enable the company to continue to operate, make proper reservation for its surplus, maintain its standard of equipment and service and pay interest on its bonds. No dividend has been paid on the stock and none is likely to be paid for an indefinite period. The gross earnings of the company have decreased steadily in the last two years, and during the first ten months of the present fiscal year the road has been operated at a loss.

Safety Campaign Receives Support.—The safety work of the Kansas City (Mo.) Railways has been extended to the enlistment of public support in movements that will promote expeditious handling of vehicles and crowds. The company has co-operated with the city authorities by displaying dash cards with the words, "Don't Be a Jay Walker." The local city club became interested, and with the help of E. E. Stigall, purchasing agent of the company, has started a campaign against pedestrians cutting corners and loitering in busy thoroughfares. The club had several thousand cards printed with the injunction to jay walkers, and traffic rules approved by the police department. The Boy Scouts have also been enlisted to give directions to pedestrians.

Better Service Asked in Tacoma.—A number of Tacoma residents have filed a formal complaint with the Public Service Commission of Washington against the Tacoma Railway & Power Company, alleging that the car service on the Tacoma Avenue and Center Street lines is insufficient. The complainants request that the fifteen-minute service on the Tacoma Avenue line, which on May 14 was replaced by a forty-minute schedule, be re-established. According to the complaint, more than 100 business houses are dependent on the Tacoma Avenue street car line, while Center Street is in the factory district of the city, and hundreds of workmen and school children have been greatly inconvenienced by discontinuance of the former service.

Knoxville Jitneys Oppose Ordinance.—The final reading of a new jitney ordinance has been postponed by the City Commissioners of Knoxville, Tenn., in order that they may consider a petition presented by A. L. Butcher for the jitney operators. The petition protests against the restrictions the ordinance places upon jitneys, which, among other things, requires them to have regular schedules for operation and certain places at which to discharge and take on passengers. It was claimed by Mr. Butcher that such restrictions tend to hamper the service of the jitneys and that the people patronizing them are satisfied with the present service. Mayor McMillan said that although the petition would receive consideration the ordinance was intended for the benefit of the public and not for the convenience of the operators.

New Auto-License Law.—A bill recently passed by the New York Legislature requires all who own or drive automobiles in New York City to have licenses. The card issued with the license by the Secretary of State must be carried by the operator for identification. The law had its inception in agitation by the Safety First Society of New York. It provides, besides a quick means of identification for every motor vehicle operator, power for the Secretary of State to suspend or revoke the license of any operator for the following offenses: A third or subsequent violation of the speed law, conviction for felony, disability of the holder of a license by reason of intoxication or use of drugs, gross negligence by the operator as a result of which person or property is injured, going away without stopping or giving name and address after causing injury to any person or damage to any vehicle, and operating a motor vehicle in a manner showing a reckless disregard for the life or property of others.

Badges for Jitney Drivers.—The Board of Street and Water Commissioners of Newark, N. J., has issued identification badges to be worn by all jitney drivers in the city. Complaints by the public that drivers had frequently given fictitious names and thus caused innocent drivers to be called to the City Hall for explanations for offenses resulted in the adoption of the badges. The new rule will be enforced by the traffic supervisor. It is claimed that half of the traffic accidents have been caused by drivers placed in temporary charge of the cars to make only one or two trips who disregarded traffic laws in their eagerness to obtain fares, and it was almost impossible to place the blame. There is also a movement on foot on the part of more careful auto owners to have barred from the jitney business men whose cars are operated by others exclusively, and who discharge their drivers unless a stated sum is returned each day. This practice leads to reckless driving in order to meet the owners' demands.

Jitney Ordinances Amended.—Three amendments to the traffic ordinances of Springfield, Mo., have been passed by the City Council of that city in an effort to check violations of the traffic laws. The first provides that every jitney or taxicab must have the city license number painted on both sides of the car in Gothic letters not less than 3 in. high. A second amendment provides that every jitney in the service shall be provided with a green lamp, to be burned from half an hour after sunset until half an hour before sunrise, and that every taxicab shall be provided with a yellow lamp, to be burned during the same period. The third provides that no vehicle shall stand within the limits of a street intersection, within 10 ft. of such intersection, within 15 ft. of a fire hydrant or within 60 ft. of an intersection property line where street cars take on or discharge passengers. Another amendment will be introduced later to prohibit jitney drivers from soliciting business by shouting that their cars are about to leave for a certain point.

Fare Increase Granted to Chicago & Joliet.—The Public Utilities Commission of Illinois has granted a fare increase to the Chicago & Joliet Electric Railway, which will give an average rate per mile of 1.87 cents as against the present average of 1.34 cents and allow the company to earn a return on its investment of slightly more than 6 per cent. The fare from Joliet to Lockport has been increased from 5 to 10 cents and from Joliet to Chicago from 40 cents to 55 cents, with the round trip increased from 75 cents to $1. The fare to all other points has been correspondingly increased. In its decision the commission found that the earnings of the road under the present tariff, based on figures furnished by the company and on data obtained by an engineer employed by the commission, were not sufficient to pay a reasonable return on the investment in the property. The company will file an amended schedule of rates on or before July 20 with not less than three days' notice to the commission and the public, and the tariff will thereafter become effective. A maximum charge of 2 cents a mile with a minimum charge of 5 cents is set forth by the commission.

Legal Notes

CHARTERS, ORDINANCES, FRANCHISES

Illinois.—*Benefits as Well as Damages to Be Considered in Suit for Realty Damages Against Elevated Railway.*

In an action for damages to realty from the construction of an elevated railroad, the benefits to the premises by reason of the increased travel, etc., may be considered in determining whether the premises have been damaged. (Brand et al. v. Union Elevated Railway, 115 Northeastern Rep., 532.)

Minnesota.—*Motorman Cannot Be Called for Cross-Examination Under "Managing Agent" Statute.*

The motorman of a street car is not a "managing agent" of the company within the meaning of the statute which authorizes an adverse party to call a managing agent of a corporation for cross-examination. (Moore v. St. Paul City Railway, 162 Northwestern Rep., 298.)

Mississippi.—*Cutting Shade Trees—Nominal Damages.*

Where a light and railway company, through its agents, trespassed on plaintiff's property without her consent and cut the limbs of her ornamental shade trees standing thereon, the company was liable for nominal damages for invading plaintiff's rights, though she showed no actual damages. (McGhee v. Laurel Light & Railway Co., 74 Southern Rep., 434.)

New York.—*The Crossing of One Line With Another Does Not Make It a "Connecting Branch."*

Under railroad law (Consol. Laws, Chap 49, Sec. 181) an electric railway company is not obliged to give transfers from one line to another simply because the lines cross each other. (Oatman v. International Railway, 163 New York Sup., 495.)

LIABILITY FOR ACCIDENT

Indiana.—*Free Pass—Stipulation Against Liability for Accident.*

A pass issued by a railroad to an officer of another railroad, in exchange for passes issued by his road to officers of the railroad first mentioned, as authorized by law, is a gratuity, so that a provision therein that the user should assume risk of accident is binding, preventing recovery for his death while riding thereon, unless caused willfully.

Evidence in action for death, by collision of trains, of person riding on free pass, held not to support a charge of willful killing. (Fort Wayne & Wabash Valley Traction Co. vs. Justus, 115 Northeastern Rep., 585.)

Michigan.—*Passengers Must Be Safely Aboard Before Car Starts.*

A passenger who was thrown from the platform of an interurban car which he boarded just as it started claimed that he was delayed as he was waiting for others to enter. The court charged, among other things, that one who boards a car after it had left its regular stopping place does so at his peril, disregarding plaintiff's contention that he boarded the car in safety. Held, that as one need not call himself to the attention of the conductor before becoming a passenger, the charge was erroneous, not presenting the issue involved, and misleading the jury. (McKenzie v. Detroit, Jackson & Chicago Railway, 161 Northwestern Rep., 970.)

Rhode Island.—*Passenger on Running Board Struck by Pole.*

An electric railway company is not compelled so to construct and locate its tracks and poles that it will be physically impossible for a passenger riding on the running board of a car to bring himself in contact with the poles. It is sufficient if the company provide for the safety of passengers while acting within the scope of their privileges, or within such limits as may be reasonably anticipated. Hence, when a passenger on the running board tried to pass outside of another on the running board and was struck by a pole, the company was not liable. (Milliken v. Rhode Island Company, 99 Atlantic Rep., 1023.)

Personal Mention

Thomas Fitzgerald, general manager of the Cincinnati (Ohio) Traction Company and the Ohio Traction Company, has resigned to join the officers' reserve corps at Fort Benjamin Harrison.

P. B. Rice, electrical engineer of the United Gas & Electric Enginering Corporation, New York, N. Y., has resigned to become mechanical and electrical engineer of the International Railway, Buffalo, which is controlled by the former company.

C. U. Peeling, heretofore local manager of the electric light and gas properties at Oshawa, Ont., has been appointed manager of the Cornwall Street Railway, Light & Power Company, Ltd., and the Stormont Electric Light & Power Company, Ltd., at Cornwall, Ont., succeeding William Hodge.

Hermon N. George, assistant chief claim agent of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has resigned to take up the practice of law. Mr. George was formerly employed in a clerical capacity and later as a foreman for the Standard Steel Car Company. He entered the service of the Mahoning & Shenango company in the claim department under J. W. Sturdevant in 1909, working in the Sharon and New Castle districts. About four years later he was made assistant chief claim agent. Mr. George is a graduate of the Pennsylvania State Normal School at Slippery Rock.

H. G. Gilpin, assistant general manager of the Ohio Electric Railway, Springfield, Ohio, has been promoted to the position of general manager succeeding A. Benham. Mr. Gilpin has been assistant general manager of the road with office at Lima for six years. Previous to this period he was connected with the operating department of the Cincinnati Traction Company for the same length of time, part of which he served as assistant superintendent. Mr. Gilpin has been associated with W. Kesley Schoepf, now president of the Ohio Electric Railway, for several years having been under him in 1899 during a short connection with the City & Suburban Railway in Washington, D. C. He later was identified with the Washington Railway & Electric Company, Washington, D. C., for three years after which he went to Cincinnati. The Ohio Electric Railway controls and operates about 620 miles of electric railway lines. It also does a general lighting and power business.

L. M. REELY

Lee M. Reely has been promoted to the position of welfare superintendent of the United Railways & Electric Company, Baltimore, Md., as successor to J. B. Duvall, who was made assistant superintendent of transportation. Mr. Reely's promotion was in recognition of the ability with which he discharged his duties as assistant to Mr. Duvall in the welfare work. When this department was organized about a year ago Mr. Reely became Mr. Duvall's aide and shouldered a very large portion of the work. He entered eagerly upon the execution of his duties and his chief soon found him an indispensable adjunct. It was quite natural that the mantle of the superintendent should fall upon the young man's shoulders when promotion took the head of the department to another field. Mr. Reely has been with the United Railways for several years. Before he entered the welfare work he was in the office of the assistant general manager, then James R. Pratt, who is now vice-president and general manager of the United Railways & Electric Company.

John B. Duvall has been appointed assistant superintendent of transportation of the United Railways & Electric Company, Baltimore, Md., succeeding Herbert B. Flowers. Mr. Duvall has grown up in the street railway business of that city. He entered the service when he was in his teens as an office boy and applied himself diligently to the study of his duties. Within a few years he was occupying a position in the claim department and was later stepped up to an important position in that branch of the work. The United Railways has for many years displayed a substantial interest in the welfare of its employees, and when the demands of the work upon those in charge made it necessary to create a separate department Mr. Duvall was chosen as its head. He organized the work, which previously had been divided among various departments and employees, and systematized it so as to eliminate much unnecessary effort. Following the annual election of officers this year, when Mr. Flowers was chosen assistant general manager, Mr. Duvall was selected to succeed him.

J. B. DUVALL

Frank Rusch has been appointed superintendent of motive power of the Puget Sound lines of the Chicago, Milwaukee & St. Paul Railway, with office in Tacoma.

Albert Benham, heretofore general manager of the Ohio Electric Railway, Springfield, has been appointed general manager of the Cincinnati (Ohio) Traction Company and the Ohio Traction Company as the successor to Thomas Fitzgerald. Mr. Benham has been connected with the Ohio Electric Railway since 1908, for the first five years of that period as assistant general manager. He was born in Ohio in 1868. At the age of twenty-three he entered the service of the Fifth Avenue Cable Company, Pittsburgh, Pa., and remained with that company and the Consolidated Traction Company, Pittsburgh, for ten years. In January, 1901, he became inspector and later assistant general superintendent for the Cincinnati Traction Company, which he served until 1906. The next two years found him in the position of general superintendent for the Indiana, Columbus & Eastern Traction Company, Cincinnati, Ohio, with headquarters at Columbus, after which he accepted the position of assistant general manager of the Ohio Electric Railway. Mr. Benham is a past president of the Central Electric Railway Association, having been succeeded by Mr. Wilcoxen last March.

A. BENHAM

Obituary

John F. Calderwood, former vice-president and general manager of the Brooklyn (N. Y.) Rapid Transit Company, died on June 14, according to a late press despatch. Failing health caused his retirement from business three years ago and since then he has resided at Long Lake, near Minneapolis, Minn.

A. B. Chichester, claim agent of the Little Rock Railway & Electric Company, Little Rock, Ark., died on May 30 following a stroke of paralysis. Mr. Chichester was born in Augusta, Ga., in 1866 and went to Little Rock early in life. He served as deputy sheriff and later as city detective. He had been employed by the Little Rock Railway & Electric Company for ten years and was regarded by his associates as a loyal and conscientious worker and a very capable man in his position with the company.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Wrentham, Mass.—The Milford, Attleboro & Woonsocket Street Railway has asked the Public Service Commission for its approval of the relocation of its tracks in the State highway on South Street, Wrentham.

Cincinnati, Ohio.—The Rapid Transit Commission, City Council and officials of the Cincinnati, Newport & Covington Street Railway are endeavoring to revise the proposed twenty-five-year franchise to the latter in such a way as to be satisfactory to all. The railway has arranged to have its terminal in the Dixie Terminal Building, but the commission feared that its tracks on Walnut Street might interfere with the construction of the rapid-transit loop. Polk Laffoon, secretary of the Cincinnati, Newport & Covington Railway, urged prompt action by Council at a recent conference, and Attorney Harry Lynch, acting for the terminal building, stated that it will be completed by the time work on the loop tracks at Third and Walnut Streets is begun.

Columbus, Ohio.—The Columbus Railway, Power & Light Company on June 8 notified the Franklin County Commissioners that it could not accept the franchise proposed by them for the Columbus-Westerville interurban line and that its own proposition, submitted recently, had been withdrawn. It further notified the commissioners that the work of removing the tracks will be begun on June 14. Residents of Westerville and owners of subdivisions and private property have become very much wrought up over the matter and an attempt will be made to secure a settlement between the company and the commissioners. About 1200 people use the line daily.

Salt Lake City, Utah.—The Salt Lake & Utah Railroad has received permission from the Public Utilities Commission of Utah to construct a line from Granger to Magna.

Bellingham, Wash.—The Puget Sound Traction, Light & Power Company has asked the City Council for permission to plank the company's right-of-way on Lake Street, between Ellis and Humboldt Streets. If the request is granted a double track will be laid on that street and a connection with the Lake line will be made via the same route some time in the near future.

TRACK AND ROADWAY

Oakland, Antioch & Eastern Railway, Oakland, Cal.—Application has been made by the Oakland, Antioch & Eastern Railway to the Railroad Commission of California for permission to discontinue the operation of the Sacramento Valley Electric Railroad from Dixon Junction to Dixon, which it operates under lease.

United Railroads, San Francisco, Cal.—An agreement has been entered into by the United Railroads and the city officials of San Francisco whereby the Municipal Railways can use the poles and span wires of the United Railroads on Market Street and Van Ness Avenue.

Southern Traction Company of Illinois, East St. Louis, Ill.—It is reported that negotiations are under way for the sale by the receivers of the line of the Southern Traction System, extending from Belleville to St. Louis, to the Michigan Central Railroad. It is understood that the Michigan Central Railroad will operate only coal trains on the line, which originally was intended to be for electric passenger and freight traffic.

Tri-City Railway, Davenport, Iowa.—This company is asking for bids for the construction of its new line on Rock Island arsenal island.

Wichita Railroad & Light Company, Wichita, Kan.—This company will construct new tracks across the concrete bridge spanning the Arkansas River at Douglas Avenue.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me.—Work has been begun by this company on the construction of an extension on Webber Avenue, Lewiston.

United Railways & Electric Company, Baltimore, Md.—This company has awarded a contract to the Union Switch & Signal Company to provide signal protection for its drawbridge over Bear Creek in connection with the automatic block installation.

Saginaw-Bay City Railway, Saginaw, Mich.—Work will be begun at once by the Saginaw-Bay City Railway on the reconstruction of its tracks on the Genesee line from Warren Avenue west to the approach to the Genesee Avenue bridge, 100-lb., 6-in. T-rails being used. It is expected that the work will cost about $30,000.

United Railways, St. Louis, Mo.—A plan is being considered by the United Railways to remove its tracks on Washington Avenue from Jefferson to Compton Avenue and lay them on Lucas Avenue, thereby opening up Washington Avenue as an east-and-west artery for traffic.

***Bathurst Electric & Water Power Company, Ltd., Bathurst, N. B., Can.**—This company has asked the New Brunswick Legislature for an amendment to its charter to give it authority to operate an electric railway in Bathurst and vicinity. J. P. Lager, Bathurst, president and general manager.

Rahway Valley Railway, Summit, N. J.—Negotiations have been opened with the Public Service Railway by the Rahway Valley Railway, which has the right-of-way and will extend and electrify its line from Summit to a point near Boyden Avenue, Hilton, with a view to reaching a traffic agreement whereby through service over that route from Newark to Summit may be had.

Brooklyn, N. Y.—The Public Service Commission for the First District of New York, through Chairman Straus, has addressed the Board of Estimate and Apportionment of New York City, asking that body to act within a short time upon the various propositions looking to traffic relief in central Brooklyn, including the proposal for relocating the tracks of the Fulton Street elevated line in Adams Street and for laying out a connection between the Fulton Street elevated line and the Fourth Avenue subway.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York recently received bids for the installation of tracks on the Pelham Bay Park branch of the Lexington Avenue subway. The line is three-tracked, part subway and part elevated, extending from a junction with the Lexington Avenue line near 135th Street and Park Avenue to Eastern Boulevard and Pelham Bay Park. The low bidder for the work was the Terry & Tench Company, Inc., New York, whose offer was $363,860. A number of contracts have been awarded by the Interborough Rapid Transit Company to the Union Switch & Signal Company to provide interlocking and automatic block signal apparatus on several of its lines. The interlocking plants are to of the electro-pneumatic type; the automatic signals in the subway of the Interborough light type, those on the suburban lines of the daylight type with color indication, and the interlocking signals on the suburban lines of the electropneumatic type, with electropneumatic train stops.

Lake Shore Electric Railway, Cleveland, Ohio.—It is reported that this company is considering the double-tracking of its line on West Erie Avenue, Lorain.

United Railways, Portland, Ore.—Construction work has been begun by the United Railways on an extension from Wilkesboro to Tillamook.

Westside Electric Street Railway, Charleroi, Pa.—This company reports that it is in the market for 125 tons of 70 to 80-lb. T-rail, new or rerolled.

Johnstown-Somerset Traction Company, Johnstown, Pa.—Contracts have been awarded by the Johnstown-Somerset Traction Company for the ties, track and trolley wire necessary for the completion of its line between Johnstown and Jerome, and it is expected that the line will be completed before the end of the summer. Cars and other equipment have been ordered, it is stated. Kent Miller, Somerset, secretary. [April 28, '17.]

***Columbia, S. C.**—Right-of-way is being secured for the construction of an electric railway from Columbia to Greenwood via Lexington and Saluda. As proposed, the new line would connect with the Piedmont & Northern Railway at Greenwood. Frank Haskell, Columbia, chief engineer.

Austin (Tex.) Street Railway.—This company will construct an extension of its South Austin line to Fairview Park.

Dallas Northwestern Traction Company, Dallas, Tex.—Bids are being received by the Standard Utilities Construction Company (C. F. Hopkins, Tulsa, president), for the construction of the proposed railway of the Dallas Northwestern Traction Company from Dallas to Denton. [June 9, '17.]

Dallas Southwestern Traction Company, Dallas, Tex.—This company has awarded a contract to the Creek Construction Company, Sapulpa, Okla., for the construction of its proposed line from Dallas to Cleburne. The work of securing right-of-way for the line has been begun. F. R. Perkins, engineer in charge of construction. [March 17, '17.]

Houston, Gonzales & San Antonio Traction Company, Houston, Tex.—A contract has been awarded the Birmingham Construction Company, Birmingham, Ala., for the construction of this company's line from Houston to San Antonio, and it is expected that work will be begun this month. Steve Holmes, Gonzales, president. [March 3, '17.]

Ogden, Logan & Idaho Railway, Ogden, Utah.—This company will construct an extension of its Washington Avenue line from Twenty-eighth Street to Thirty-sixth Street and from Thirty-sixth Street to the Riverdale Road.

Virginia Railway & Power Company, Richmond, Va.—It is reported that the Virginia Railway & Power Company contemplates the construction of several new double-track lines and also some single track in Norfolk.

SHOPS AND BUILDINGS

Kansas City, Mo.—An ordinance has been passed by the City Council of Kansas City locating the union station for the use of the interurban railways at the northeast corner of McGee and Tenth Streets, extending through to Oak Street, with entrances both on Tenth and McGee Streets. C. C. Peters, president of the Interurban Central Station Company, which will build and operate the station, has announced that construction will be begun as soon as the ordinance is signed by the Mayor.

POWER HOUSES AND SUBSTATIONS

British Columbia Electric Railway, Ltd., Vancouver, B. C.—This company contemplates extending its transmission lines to Hollyburn.

Union Traction Company, Coffeyville, Kan.—This company has entered into a contract with the Kansas Gas & Electric Company for the supply of power for its system from Parsons, Kan., to Nowata, Okla. The Kansas Gas & Electric Company, it is reported, will erect a new electric plant to take care care of its increasing business.

Union Light & Power Company, Junction City, Kan.—This company plans the construction of underground coal pits for storing coal in large quantities. The company will also install two large engines to take care of the increasing demands on the plant.

Milford & Uxbridge Street Railway, Milford, Mass.—This company reports that within the next ten weeks it expects to place contracts for two 750-kw. rotary converters and one 300-kw. rotary converter with transformers and switchboards.

Kansas City (Mo.) Railways.—Work has been begun by the Kansas City Railways on the erection of a substation at Fifty-ninth Terrace and Swope Parkway.

Interborough Rapid Transit Company, New York, N. Y.—A new 60,000-kw. unit consisting of a high-pressure and two low-pressure turbines, each coupled to a generator, will be installed by the Interborough Rapid Transit Company at its Seventy-fourth Street station. The turbines and generators are being furnished by the Westinghouse Electric & Manufacturing Company.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Helping Railways to Reduce Expenses

Results Make for Lower Selling Costs—Training Railways to Do Their Own Welding

By W. R. HULBERT
Sales Manager, Goldschmidt Thermit Company, New York City

The inventive powers of the engineers employed by some manufacturers of electric railway supplies are being taxed to the limit these days in order to find substitutes for raw materials, formerly obtainable but now impossible to get either on account of imports being cut off or through exorbitant prices and poor deliveries.

Before the war this company received from Austria all of its magnesia tar which was used in making crucibles. The inability to obtain this raw material at first presented a serious problem, as the Austrian magnesite contained a small percentage of iron which was lacking in other magnesite. After months of experimenting it was found possible to use domestic or Grecian magnesite, and the requisite amount of iron was later introduced. The crucible thus obtained has been found to be very satisfactory. Formerly crucibles for rail welding could be made that would average twenty to thirty-five reactions. The crucibles which are being manufactured at present will approximate that number, although the first crucibles made from magnesite without iron burned out completely in from ten to fifteen reactions.

With the crucible proposition out of the way we set ourselves to the problem of reducing costs to the customer in spite of a steady increase in the prices paid by us for raw materials. One way to accomplish this, and which occurred to us first, was to devise a method by which a given quantity of thermit could be made to produce more superheated steel for the welding operation. We have always mixed a certain proportion of mild steel punchings with the thermit. These are melted down to increase the amount of steel, but it is considered inexpedient to add more than 15 per cent for fear of cooling the thermit reaction too much. What we have now done is to devise a method of preheating steel which is to be combined with the thermit instead of pouring it into the thermit cold. Much less heat is then required and a proportionate amount of thermit is thus saved without decreasing the temperature of the thermit or the efficiency of the joint. The results have been very satisfactory, for in spite of market and labor conditions, the price of thermit-welded joints, including new steel inserts, has been reduced instead of being increased several times, as is the case with most products.

RAILWAYS DO THEIR OWN WELDING

Up to a few years ago electric railway companies were in the habit of contracting for the welding of their rail joints, and in fact some of this welding by other processes is still done on that basis because of the expensive apparatus which has to be used. We have found, however, that we can save the railway companies a great deal of money by teaching them to do the welding themselves. Where the welding was done by contract it necessitated our keeping a large force of trained men so as to be able to take care of our customers' requirements at the times when the welding had to be done. As very little of this welding in the Northern cities is done in the winter time, the company was put to great expense in carrying these men over the slack period. It was not good policy to let these men go, as we would then have to train a force of green men each year. Carrying them over, however, resulted in a large overhead expense which, of course, had to be taken care of in the price charged for the rail welding.

We decided to make an effort to induce some of our customers to do their own welding, in which case we supply only one supervisor to assist them in organizing the work at the start. The results not only reacted to our benefit but very greatly to the benefit of the customer, who was able to do the welding with his own track force and without penalty for delays due to inclement weather, slow track or anything else. If anything happened to hold up the welding there was plenty of other work for the track men to do. As a result the customer saved the large overhead expense and the charge for contractors' labor and was able to do the welding whenever and wherever he pleased.

Practically all our customers now purchase the equipment and we supply without charge a competent superintendent at the start to organize the work and see that the welding gang is properly trained. These superintendents are then at liberty to travel from one city to another keeping an eye on the work and from time to time giving the customer the benefit of any advice that might be needed. Under this system a constant improvement in results has been noticed, and customers are welding from thirty-five to forty joints in a ten-hour day with a track gang of nine men. Some of the companies who are doing rail welding in this way are the San Antonio Street Railway, the Northern Texas Traction Company, the Mahoning & Shenango Railway & Light Company, the Pittsburgh Railways, Oklahoma City Railway and Third Avenue Railway of New York.

Big Demand for Field Coil Linen Tape

Surplus Stock, Usually on Hand in the Spring, Exhausted—Promises for Deliveries Being Met Substantially

By A. A. TUCKER
Secretary Hope Webbing Company, Providence, R. I.

Deliveries on large orders for cotton and linen tape for insulating wire used in motors and generators can now be made in about six months. Up to and including one year ago an order of this kind could be filled out of stock or at least within thirty days, providing the order called for regular sizes. All orders received by this company are being delivered substantially as promised. At the present time the demand for this company's products, which, in addition to the above, includes braided sleeving for motor leads and leads from coils, is from two to three times what it was two years ago in spite of the fact that the production has been increased 100 per cent during that period.

In 1914 this company was manufacturing 50 per cent more than the demand and was thus piling up excess stock, which no doubt accounted for the excellent deliveries made during that period. We are now making 50 per cent less than the demand and, in addition, our stock is being decreased to a minimum. Raw materials have gone up in excess of 100 per cent. Cotton warp which formerly cost 18½ cents is now quoted at 48. The mills from which the raw stocks are obtained are sold ahead until the first of January. It has been necessary to order raw materials many months in advance in order to get a steady flow of deliveries through our plant.

Prospects for the next four or five months are that the demand will be steadily increasing and that deliveries may become a little slower on account of the unsettled conditions of the raw materials market. Maintenance orders for large railways are practically the same as in former years, there being a very slight falling off in the amounts ordered. The biggest orders that have been placed recently in the railway field have been for equipment to be used on the electrification of steam roads.

Committees on Cars and Locomotives Named

The Council of National Defense announces the creation of co-operative committees on railway cars and locomotives, to serve with the committee on transportation and communication, of which Daniel Willard, chairman of the advisory commission of the counsel, is chairman. S. M. Vauclain, vice-president of the Baldwin Locomotive Works, is chairman of both co-operative committees. The other members of the two committees are as follows: Co-operative committee on cars: E. F. Carry, president Haskell & Barker Company; Charles S. Gawthrop, vice-president American Car & Foundry Company; Clive Runnels, vice-president The Pullman Company; R. L. Gordon, assistant to president Standard Steel Car Company; A. S. Reeder, vice-president Pressed Steel Car Company; S. T. Bush, president Buckeye Steel Casting Company. Co-operative committee on locomotives: Andrew Fletcher, president American Locomotive Company; H. P. Ayers, vice-president H. K. Porter Locomotive Company; Joel S. Coffin, Lima Locomotive Corporation.

It will be the function of these two committees to assist in solving the problem of increasing the output of cars and locomotives through co-ordination of the efforts of manufacturers and to aid in making as efficient use as possible of existing rolling stock.

Car Manufacturer Makes Economy Suggestion

An executive of one of the electric railway car-building companies makes a pointed suggestion on economy. He says that few passengers on leaving a street or interurban car can describe the finish of the car in which they have just ridden. The general effect of the car interior creates the impression that lasts in the passenger's mind. The passenger does not consider in detail how the effect is obtained.

Applying this to the car-building business, this manufacturer stated that in the ordinary car the door, sash, window posts and other interior finish require about 1000 bd.-ft. of material. The most popular wood for interior finish is mahogany. A substitute for mahogany is stained birch. At this time mahogany costs $350 a thousand feet and birch but $24 a thousand feet. Thus the manufacturer suggests to the master mechanic a possible saving of more than $300 per car, and according to the manufacturer results will about balance so far as service is concerned.

Manufacturers Urged to Expand

Steel Business After War to Form Basis of Future National Prosperity

Charles M. Schwab, chairman of the Bethlehem Steel Corporation, speaking before the World's Congress of Salesmanship at Detroit, Mich., said that the end of the war will find us engaged in world politics, in international trade and in world affairs on the largest possible scale and predicts that of this vast expansion of world effort and energy, the steel business will form the basis just as it has been the basis of our own national development in the past twenty-five years. Mr. Schwab said in part:

"The United States produced 1,000,000 tons of steel in 1880, in 1916 some 40,000,000 tons were produced. The 1917 production will probably be 45,000,000 tons. When the U. S. Steel Corporation was formed, fifteen years ago, the annual steel production of the country was only 12,000,000 tons and many believed we were then at the zenith of the steel business. My own belief is that we are just as far from the zenith to-day as we were in 1901.

"Let me tell you something of the experience of the Bethlehem Steel Company. Last year we entered upon a constructive program involving expenditure for the next few years of about $100,000,000. Many of our friends urged us to go slowly and wait until all costs should be reduced. But we believed that when facilities were needed they ought to be provided, and that a manufacturer should not speculate upon what he might be able to do in the future. He should do it now. That was the largest construction undertaking, I believe, ever entered upon by a single corporation.

"Costs are very much higher now than they were then. They promise to be much higher in the future. But by beginning when we did we were able to greatly increase our facilities, so that they are available now when they are needed in the interests of national defense."

$5,000,000 in Electrical Exports for March

Another record for electrical exports was broken in March, when the value of electrical merchandise shipped abroad was $5,199,163. This is the first time that the monthly exports of electrical goods have passed the five-million-dollar mark. March exports were more than 80 per cent greater in value than March, 1916, exports.

For the first quarter of the current year electrical exports amounted to $13,638,356, in comparison with $8,148,238 for the corresponding period of 1916. Should the volume of business transacted during the first three months of this year be maintained during the remaining nine months, the exports for the year will total up in the neighborhood of $55,000,000.

During the nine months ended March, 1917, the value of electrical exports was $36,992,204, which is but a few million dollars less than the record total for the entire twelve months of 1916; for the nine months ended March, 1916, $21,036,098, and for the nine months ended March, 1915, $13,867,092.

That these figures are not larger than they are is owing entirely to the swamped condition of the American factories. The foreign market for American electrical goods has been almost limitless. Domestic demand and inability to produce more than so much prevented American manufacturers from seeking foreign business as actively as otherwise might have been the case.

New Location of General Electric Offices

The New York offices of the General Electric Company on June 16 will be moved from 30 Church street to the Equitable Building, 120 Broadway. The entire twentieth floor of the building has been especially arranged and furnished for the General Electric Company. For nine years these offices have been located at 30 Church street, where the company had its offices when it outgrew the Edison Building at 44 Broad street. This structure was originally built for the Edison General Electric Company, which, in 1892, was combined with the Thomson-Houston Electric Company to form the General Electric Company.

In the quarter century since the General Electric Company was formed, its business has increased from about $10,000,000 in gross sales the first year of its organization to gross orders of $167,169,000 during the twenty-fifth year, and its sales offices have naturally increased in number and in importance. The company's offices in New York are the largest and most important among its district offices.

Copper Output in 1916

According to the United States Geological Survey, the smelter production of primary copper in the United States in 1916 was 1,928,000,000 lb., compared with 1,388,000,000 lb. in 1915, an increase of 39 per cent. The total value of the output in 1916 at an average price of 24.6 cents a pound is $474,288,000, compared with $242.900,000 for 1915. The total production of new refined copper in 1916 was 2,259,000,000 lb., an increase of 625,000,000 lb. from the output in 1915. Of the 1916 output of primary copper, 1, 579,620,513 lb., was electrolytic; 269,794,531 lb. Lake copper; 12,469,050 lb. casting copper and 26,868,105 lb. was pig copper. The foreign electrolytic amounted to 370,635,105 lb. The apparent consumption of refined new copper in the United States in 1916 was 1,429,755,266 lb. In 1915 it was 1,043,461,982 lb. If to the 1,429,755,266 lb. of new refined copper is added the 594,423,807 lb. of secondary copper and copper in alloys produced during the year, it is found that a total of about 2,024,000,000 lb. of new and old copper was available for domestic consumption.

NEW YORK METAL MARKET PRICES

	May 3	June 16
Prime Lake, cents per lb	31	32½
Electrolytic, cents per lb	31	32½
Copper wire base, cents per lb	36	36
Lead, cents per lb	9⅞	11⅞
Nickel, cents per lb	50	50
Spelter, cents per lb	9½	9¾
Tin, Straits, cents per lb	58½	60⅝
Aluminum, 98 to 99 per cent, cents per lb	60	61

OLD METAL PRICES

	May 3	June 16
Heavy copper, cents per lb	24½	28
Light copper, cents per lb	21½	25½
Red brass, cents per lb	18½	17½
Yellow brass, cents per lb	17½	18
Lead, heavy, cents per lb	7¾	8¾
Zinc, cents per lb	7	7
Steel car axles, Chicago, per net ton	$41.50	$48.00
Iron car wheels, Chicago, per gross ton	$24.00	$36.00
Steel rail (scrap), Chicago, per gross ton	$31.50	$39.50
Steel rail (relaying), Chicago, per gross ton	$39.00	$42.50
Machine shop turnings, Chicago, per net ton	$11.00	$18.00

CURRENT PRICES FOR MATERIALS

	May 3	June 16
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40.00	$40.00
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38.00	$38.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.85	$4.00
Steel bars, Pittsburgh, per 100 lb	$4.00	$4.40
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$7.35
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$9.05
I-beams over 15-in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl	$2.12	$2.40
Cement (carload lots), Chicago, per bbl	$2.16	$2.31
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.22
White lead (100 lb. keg), New York, cents per lb.	10¾	12¼
Turpentine (bbl. lots), New York, cents per gal.	52	44

ROLLING STOCK

Indianapolis, Columbus & Southern Traction Company, Columbus, Ind., is in the market for one new 60-ft. all-steel freight car.

Columbia (S. C.) Railway, Gas & Electric Company has ordered four city cars with maximum traction trucks and four extra sets of trucks from the St. Louis Car Company.

Grand Rapids (Mich.) Street Railway has specified the following details on fifteen 33-ft. vestibule, single-end, pay-within city cars being built for it by the St. Louis Car Company:

Number	15
Name	Grand Rapids Street Railway
Builder	St. Louis Car
Type	Single-end city car
Seating capacity	48
Weight (total)	43,000 lb.
Truck centers, length	19 ft. 6 in.
Length over bumpers	46 ft. 4 in.
Length over corner posts	33 ft. 0 in.
Length over vestibule	45 ft. 4 in.
Width over posts	8 ft. 2 in.
Sill to trolley base	8 ft. 5½ in.
Floor to ceiling	7 ft. 6 in.
Body	Steel with wooden superstructure
Interior trim	Solid mahogany
Headlining	3/16 in. Agasote
Roof	Turtle deck
Air brakes	Westinghouse
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Conduits	St. Louis Car
Control, type	GE K-34
Couplers	Tomlinson, Ohio Brass
Curtain fixtures	Forsyth No. 88
Curtain material	Pantasote N-3
Designation signs	Illuminated E. S. S. Co. mechanism
Door mechanism	Hand operated. St. Louis Car
Fenders	Railway company's design
Gongs	12-in. bronze pneumatic
Hand straps	Rico sanitary
Hand brakes	Dayton drop handle, ratchet drum and Ackley staff
Heaters	Peter Smith No. 2-P
Headlights	Crouse-Hinds
Motors	Four GE 203 outside hung
Paint	Murphy ABC.
Registers	International R-S
Sand-box	With Reliance sand trap valve
Sash fixtures	O. M. Edwards
Seats, style	2 longitudinal 16 cross, Hale & Kilburn
Seating material	Rattan
Springs	Pittsburgh Steel Spring
Step treads	Mason safety-tread
Trucks, type	Standard 0-50-0
Ventilators	Automatic
Wheels	33 in. cast iron
Special devices	Faraday buzzers, Perry side bearings

Oklahoma Union Railway, Tulsa, Okla., through I. F. Crowe, is in the market for an electric locomotive to handle 400-ton freight trains, also for 70-lb. or heavier A. S. C. E. rail.

Westside Electric Street Railway, Charleroi, Pa., is in the market for a 40-ton to 50-ton electric locomotive, and also for 125 tons of 70-lb. to 80-lb. T-rail, either new or re-rolled.

Northern Ohio Traction & Light Company, Akron, Ohio, lost three cars which were destroyed in a fire at the Worcester Avenue carhouse. The loss is estimated at $30,000 and is fully covered by insurance.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, noted in the March 31 issue as ordering thirteen city and seven interurban cars from the G. C. Kuhlman Company, has specified the following details for the city cars:

Number of cars ordered	13
Date order was placed	March 21, 1917
Date of delivery	July 15, 1917
Builder	G. C. Kuhlman Co.
Type	"Peter Witt"
Seating capacity	53
Weight, car body	19,800 lb.
Bolster centers, length	25 ft. 0 in.
Length over bumpers	47 ft. 7 in.
Length over vestibule	46 ft. 7 in.
Width over all	8 ft. 2 in.
Rail to trolley base	10 ft. 7 5/16 in.
Body	Semi-steel
Interior trim	Bronze
Headlining	Agasote
Roof	Arch
Air brakes	GE.
Axles	Brill
Bumpers	Kuhlman
Car trimmings	Kuhlman
Conduits and junction boxes	Westinghouse
Control, type	H-L
Couplers	Tomlinson
Curtain fixtures	Rex
Curtain material	No curtains
Designation signs	Electric Service Supply
Door mechanism	Nat'l Pneumatic
Fare boxes	Furnished by railway
Fenders	Railway Co.'s standard
Gears and pinions	GE.
Hand brakes	Peacock McWhorter
Heaters	Peter Smith
Headlights	Electric Service Supply
Journal boxes	SR-95, No. 19535 Brill
Lightning arresters	Westinghouse
Motors	GE.-247-A inside hung
Paint	St. Louis Car Surfacer Co.
Registers	Furnished by railway
Sanders	Ohio Brass
Sash fixtures	Brill Renitent Post
Seats, style	Brill stationary transverse, longitudinal seats in rear
Seating material	Cherry slat
Springs	Brill
Step treads	Abrasive Materials Co.
Trolley	Knutson No. 5
Trolley base	U. S.
Trolley wheels	U. S.
Trucks, type	Brill 77-E-1
Ventilators	Railway Utility Co.
Wheels	26-in. rolled steel

TRADE NOTES

Robert H. Patchen has resigned as secretary of the National Foreign Trade Council to become affiliated with W. R. Grace & Company. He is succeeded by O. K. Davis.

C. A. Newman, formerly manager of sales promotion for Henion & Hubbel, has been made sales manager of the Boiler-Kote Company with offices in the Fisher Building, Chicago.

Westinghouse Lamp Company, New York, N. Y., announces the removal of its New York district sales offices from 200 Fifth Avenue to Rooms 2021-2023 at 165 Broadway, New York City.

W. L. Garland, sales representative of the Safety Car Heating & Lighting Company, Philadelphia, Pa., has been appointed representative of the Vapor Car Heating Company, Inc., effective June 1.

James H. Slawson has been elected vice-president of the Joliet Railway Supply Company, with headquarters at Chicago. Mr. Slawson was formerly sales agent of the National Malleable Castings Company, Chicago, Ill.

D. H. Thomson has been elected president and treasurer of the Terry Steam Turbine Company, Hartford, Conn., filling the vacancy caused by the death of James Terry. N. L. Snow, sales manager of the company, has been elected vice-president.

Niles Car Manufacturing Company, Youngstown, Ohio, is testing out a self-propelled interurban car, having gas-electric drive with kerosene oil engine. It is reported that this car is being given a thorough tryout on a road in the State of Tennessee.

Robert Abbott, who for the last eight years has been connected with the sales organization of the Bryant Electric Company and has managed its New York office since it was opened in 1913, sailed for France last week to join the Roosevelt Hospital Unit.

Charles H. McCormick, for a number of years connected with the Standard Heat & Ventilation Company, has been appointed special sales agent for the National Railway Appliance Company, 50 East Forty-second Street, New York City.

Blaw Steel Construction Company, Pittsburgh, Pa., announces the appointment of G. E. Land as advertising manager, effective June 1. Mr. Land has recently been connected with the advertising department of the National Tube Company.

Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio, announces that the Brick, Terra Cotta & Tile Company, Corning, N. Y., of which M. E. Gregory is proprietor, has become a licensee and will engage in the manufacture of wire-cut lug paving brick.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., at its annual meeting held on June 13, ratified the agreement for the merger with the Westinghouse Machine Company. Several amendments to the by-laws were adopted and the retiring directors were re-elected.

Arthur M. Torrey, formerly with W. S. Barstow & Company, Inc., has left that organization to re-enter the employ of Hildreth & Company, inspection engineers, 15 Broad Street, New York City, with which firm he was connected for several years prior to joining the Barstow force.

Ernest F. Learned, formerly with the engineering department of Stone & Webster, has joined the staff of the Day Baker Motor Truck Company, Boston, Mass., as head of the industrial electric truck department. He will handle the C. W. Hunt Company's electric trucks and power plant coal-handling equipment.

Henry S. Moos has been appointed director of sales by the American Machinery Syndicate through its New York office and through its sales organization in Barcelona, Madrid, Cartagena, Valencia, and other Spanish cities. Business of the Sociedad General de Representationes—New York, for whom Mr. Moos acted formerly, is continued under the name of the American Machinery Syndicate.

F. Quattrone, who until last September represented the Italian State Railways in New York, has returned to the United States as a special delegate of the Italian government as well as of the Italian State Railways and will be attached to the Italian Embassy at Washington. He will have charge of the purchase and shipment of all materials to be contracted for by the Italian government.

Harrison, Inc., Philadelphia, Pa., which was recently purchased by the DuPont interests, has arranged to take over the property of the Beckton Chemical Company of Newark and Philadelphia and of Candy, Clark & Company of Newark. The company has now obtained plants manufacturing color for paints, paper, ink., etc., and other chemicals necessary to the paint business. The price paid is estimated at $2,000,000.

J. E. Inckel, the technical chief of the Dutch Colonial Department, is coming to New York City from Amsterdam, Holland. He will enlarge the activities of the Dutch Colonial Purchasing Bureau, which in the past year, the first of its existence, has placed $3,000,000 worth of orders in America for railway rolling stock, rails and electrical machinery. It is expected that these figures will be doubled within the next year.

C. W. Chestnut, who for the last two and one-half years has been sales manager of the Western Electric Company at Omaha, Neb., was recently transferred to the Seattle office of the company. He will hold the same position at Seattle and will have supervision of both the Portland and Seattle branches. The position of sales manager in Seattle heretofore has been held by J. I. Colwell in connection with his duties as manager. Mr. Colwell will continue as manager of the Seattle office.

A. H. Sisson has resigned as president of the Southern Car Company, High Point, N. C., and in the future will be associated with the National Pneumatic Company. Mr. Sisson has been connected with the car building business for many years and his wide experience will now be employed in furthering the sale of a product which has now become a very important factor in electric railway car design. The National Pneumatic Company has a well-equipped plant in Chicago for the manufacture of pneumatic and manual door operating devices and other specialties pertaining thereto.

Lincoln Bonding Company, Cleveland, Ohio, reports that less than a year ago the company placed on the market an arc-weld bonding machine which applies the bonds to the rail by the process of reversing the current flow so as to make the rail positive and the carbon electrode negative, and since that time has sold upward of twenty-five machines. During the year twenty of the larger companies in this country have adopted the use of the Lincoln bond as standard, and the experience which these companies have had with the machine and the bond indicates that the system has met with very satisfactory results. This has led the company to believe that the demand for electric-welded bonds during 1917 will be 200 per cent or more greater than that during 1916. The system has also been adopted in a few foreign countries, and a substantial number of bonds are being exported.

General Electric Company, Schenectady, N. Y., announces that "Liberty Loan Day" at the various plants resulted in the sale of $2,955,550 worth of Liberty bonds. The Schenectady works, with 22,000 employees, the largest plant and the company's main office, leads with the surprising total of $1,055,700. The Lynn, Mass., plant is second with $577,450; the Pittsfield works are third with $282,550, and the National Lamp Works are fourth with $253,600. The company had previously announced the purchase of $5,000,000 of the Liberty Loan bonds and that it would buy bonds to any amount and allow its employees to pay for them on a liberal installment plan. A large number took advantage of this plan to buy bonds. In a number of departments every employee subscribed for a bond. The sale among workmen of foreign extraction was truly astonishing, particularly among the Italian and Polish employees.

NEW ADVERTISING LITERATURE

Flood City Manufacturing Company, Johnstown, Pa.—A bulletin on brass and bronze bearings, electric equipment, trolley line material, repair parts, etc.

Ohmer Fare Register Company, Dayton, Ohio.—A bulletin entitled "Enlist," explaining the necessity of enlisting in the training camp for efficient business service.

Stow Manufacturing Company, Binghamton, N. Y.—A pamphlet, "The Tool of the Hour—Stow," on this company's flexible shaft grinder.

Boiler-Kote Company, Chicago, Ill.—Bulletin on "Steam Boilers and How to Rid Them of Scale," descriptive and illustrative of the applications of this product to boilers.

Laclede-Christy Clay Products Company, St. Louis, Mo.—A bulletin "How Can I Offset the Increased Cost of Coal," by the use of the Laclede-Christy chain-grate stokers.

Templeton, Kenly & Company, Ltd., Chicago, Ill.—A pamphlet illustrating the number 318 Simplex pole jack. This pamphlet contains a partial list of users of this jack and a facsimile of a number of testimonial letters.

New Publications

Belt Shifters and Shippers. The fifth in the series of safe practices pamphlets. National Safety Council, Chicago, Ill., price 10 cents.

Public Utility Rates. By Harry Barker, Associate Editor *Engineering News-Record.* McGraw-Hill Book Company, New York, N. Y. 387 pages. Cloth, $4 net, postpaid.

The review of essential facts and principles of rate making contained in this book should be valuable for public authorities, engineers, company officials and others interested in public utility rate regulations. Leaving behind the mass of obscuring detail which is found in individual cases, the author has pointed out clearly the various fundamentals involved in determining the proper charges for water, gas, electricity, communication and transportation. Enough of history and technology is given in each case to enable the layman reader to understand the problems peculiar to each class of utility. To almost any man a study of the book would prove broadening.

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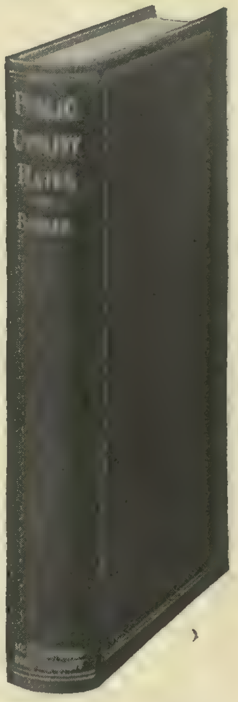

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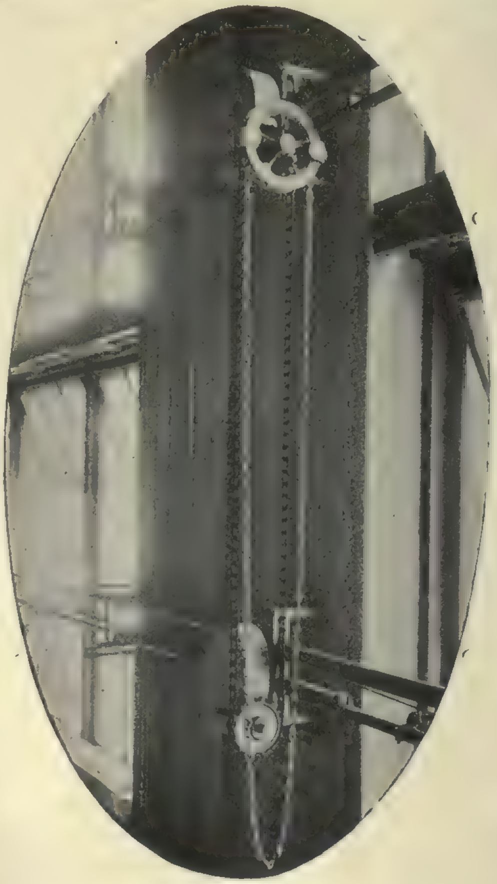

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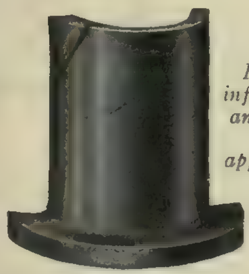

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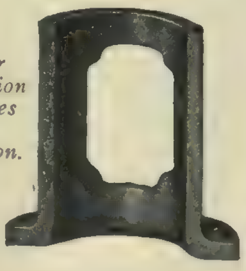

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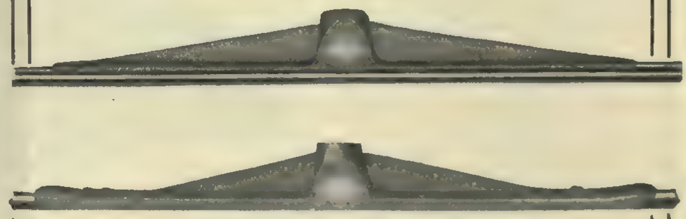

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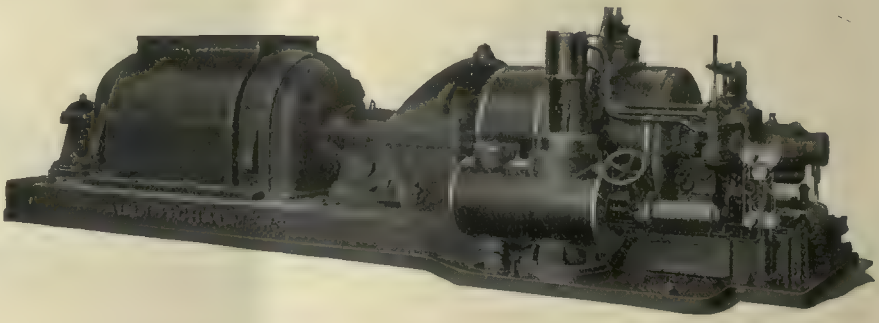

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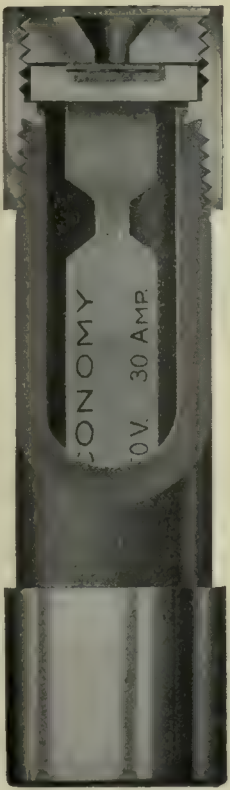

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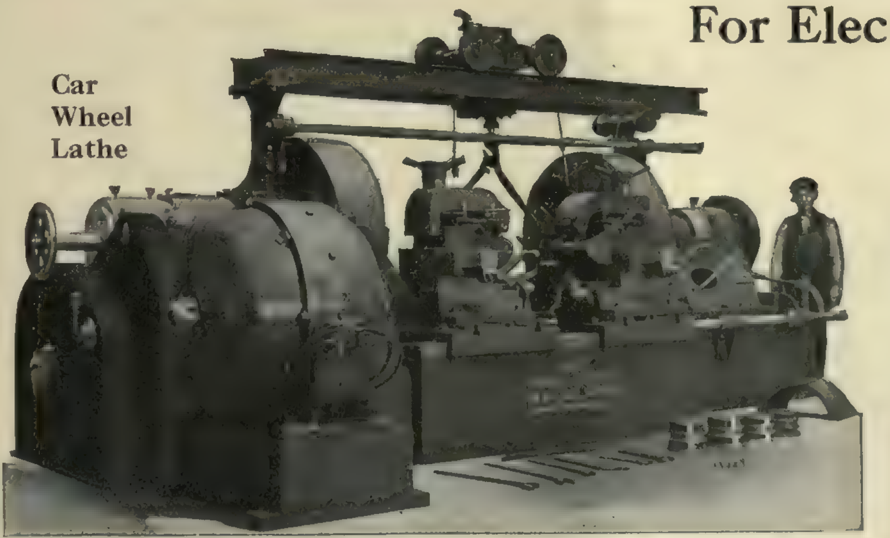

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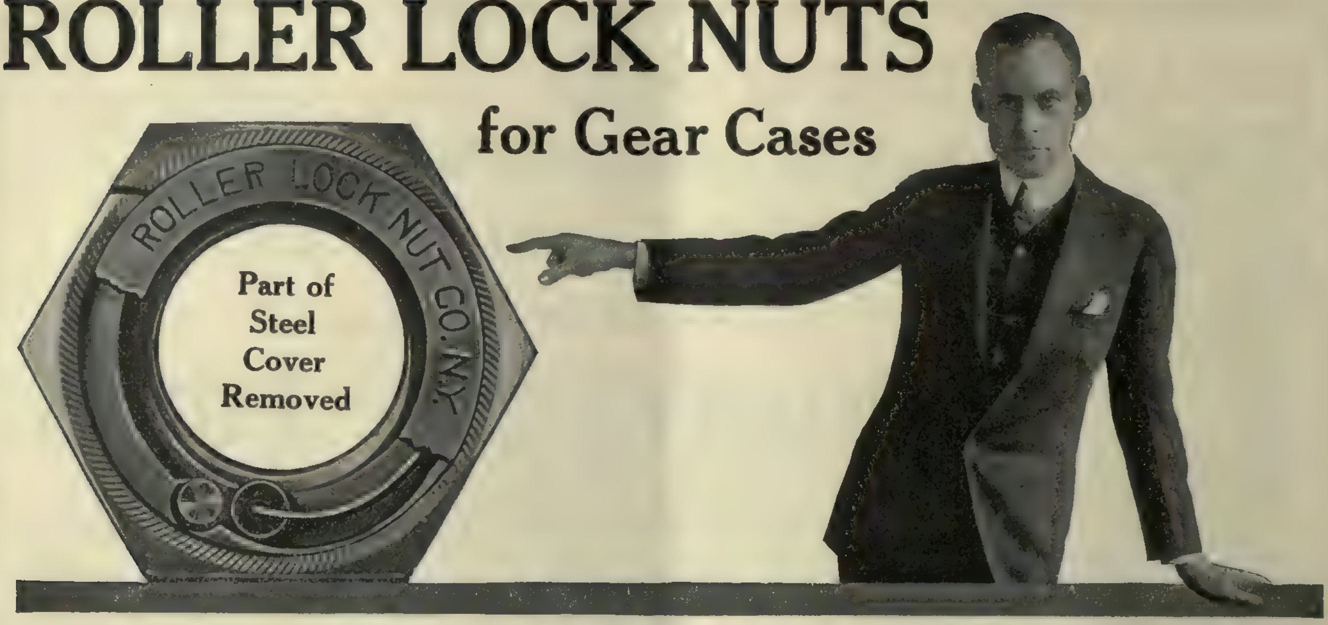
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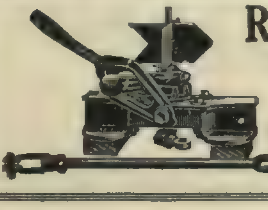

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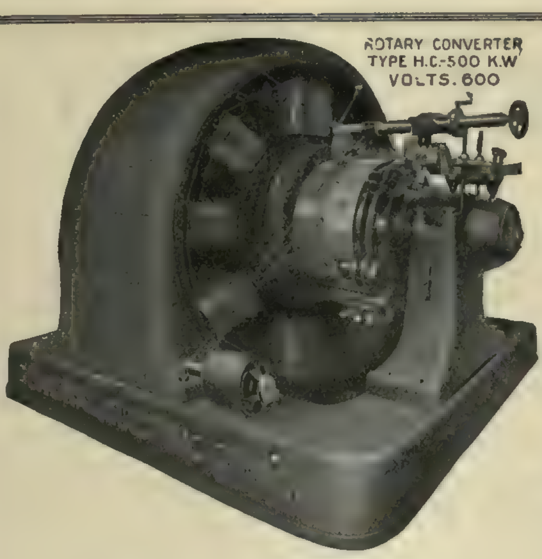

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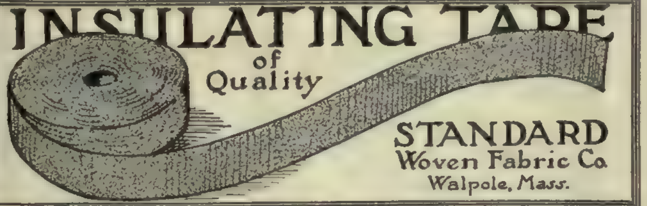
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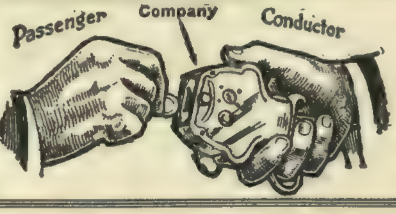

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H & K 108
Springless Back

Is specially shaped to insure comfortable seating for each of the two passengers. It is an exceptionally good seat for single-end cars. The seat cushions have the famous Hale and Kilburn springs, while the back is provided with the patented corner grip handle, an exclusive H & K feature.

HK WALKOVER
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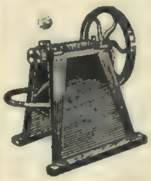
Hale and Kilburn Co.
Philadelphia New York Chicago
Washington Atlanta San Francisco

PANTASOTE
The National Standard for Car Curtains and Car Upholstery
AGASOTE HEADLINING
The only headlining made in one solid piece. Will not separate, warp or blister. Waterproof and homogeneous.
The Pantasote Company
11 Broadway, New York. People's Gas Bldg., Chicago, Ill.
797 Monadnock Bldg., San Francisco, Cal.

Cleveland Fare Boxes
Cleveland Fare Box Co.
5318 St. Clair Avenue
Cleveland, Ohio

WE CAN CUT YOUR COST OF
HEATING CURRENT
Write for THERMOSTATIC CONTROL INFORMATION
GOLD
ELECTRIC HEATERS Cut Installation and Maintenance Charge.
VENTILATORS Also Ventilate in Stormy Weather.
THERMOSTATS Save Current.
ORIGINATED the use of NON-CORROSIVE Wire for Electric Car Heaters.
ORIGINATED The Ventilated Coil Support.
LET US FIGURE ON YOUR NEXT REQUIREMENTS
Gold Car Heating & Lighting Co. 17 Battery Pl., New York

ECONOMY
SANGAMO
BUILT LIKE A WATCH
METERS
—the only means at your disposal to accurately measure the power consumption of cars. You can well afford to investigate. Bulletin 416.
Sangamo Electric Company
Springfield, Illinois
New York 50 Church St. Minneapolis Met'p'ltan Life Bldg. Los Angeles San Fernando Bldg



Saved from the Ashes as many tickets are, means nickels loss to you. Avoid the risk.
Patten Ticket Destroyer is used right in the office under the eyes of trustworthy employes.
It mutilates beyond redemption.
Scrap sold will pay for the machines.
Ask us for Circular J.
PAUL B. PATTEN CO.
78 Lafayette St., Salem, Mass. U.S.A.

HEATING AND VENTILATING YOUR CARS is the problem to-day. Let us show you how to do both with one equipment. Now is the time to consider this change before you start your cars through the shops for overhauling. Kill two birds with one stone.
THE PETER SMITH HEATER COMPANY
1759 Mt. Elliott Ave., Detroit, Mich.

Use them in your terminals—
PEREY TURNSTILES or PASSIMETERS
Faster than the ticket seller
Perey Manufacturing Co., Inc.
30 Church Street, New York City

Ventilation—Sanitation—Economy—Safety
All Combined in
The Cooper Forced Ventilation Hot Air Heater
Patented September 30, 1913. Ask for the full story
We also Manufacture Pressed Steel Hot Water Heaters
THE COOPER HEATER CO. CARLISLE, PA.

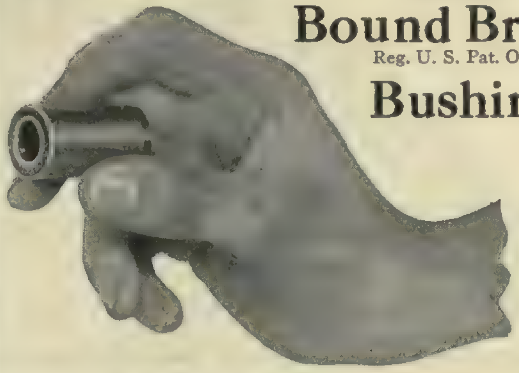
TROLLEY POLES

Our stock of over 7000 high carbon steel poles is at all times available for immediate shipment.

These poles are of high grade special skelp, properly reinforced, and will sustain a wheel pressure of from 35 to 40 pounds without taking a permanent bend.

NUTTALL
PITTSBURGH

A Recessed
Trade Mark
Bound Brook
Reg. U. S. Pat. Off.
Bushing



This is a close-up of a Bound Brook trolley wheel graphite bushing, showing the neat groove recessed in each end for the insertion of graphite to take care of any end thrust. The graphite placed in these recesses goes through the same careful course of thorough preparation, as the graphite within the casting.

All genuine graphited "Oil-less" Bearings have always been made at Bound Brook, N. J., in the United States of America, by the

Bound Brook Oil-less Bearing Co.
FORMERLY
Graphite Lubricating Company

The Kalamazoo Trolley Wheels

have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.

THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

Holden & White Inc.

Electric Railway Sales Distributors for:

Wasson Air-Retrieving Trolley Bases. (U. S.)
Garland Ventilators.
Perry-Hartman Self-Centering Center Plates and Anti-Friction Side Bearings.
Watson Car Lighting Regulator.
Anderson Brake Slack Adjusters.

Chicago District Representatives for:

Drew Line Material.
Columbia Car & Shop Equipment.
Miller Trolley Shoe.
Lincoln Rail Bonding and Bonds.

1508 Fisher Building **CHICAGO**

UNIVERSAL ANTI-SLIP TREADS
cars and station steps.

Universal Safety Tread Company
Waltham, Mass.

RAILWAY UTILITY COMPANY
Sole Manufacturers
"HONEYCOMB" AND "ROUND JET" VENTILATORS
for Monitor and Arch Roof Cars, and all classes of buildings; also
ELECTRIC THERMOMETER CONTROL
of Car Temperatures.

721 W. FULTON ST.
Chicago, Ill.
Write for Catalogue
1328 BROADWAY
New York, N. Y.

MASON SAFETY TREADS—prevent slipping and thus obviate damage suits.

KARBOLITH CAR FLOORING—for steel cars is sanitary, fireproof and light in weight.

STANWOOD STEPS—are non-slipping and self-cleaning.

Above products are used on all leading railways. For details address

AMERICAN MASON SAFETY TREAD CO.
Main Offices: Lowell, Mass.
Branch Offices: Boston New York City, Chicago, Philadelphia, Kansas City, Cleveland, St. Louis.

"GLOBE" The Universal Ventilator

Globe Ventilator Co., Troy, N. Y.

"Zero" AND "Motor"

STANDARD for a THIRD of a CENTURY

The Mileage Babbitt

Post's ZERO and MOTOR metals have been standard for a third of a century in shops where mileage records are attained. Nothing but highest grade of virgin raw materials used.

Write us for details.

E. L. Post & Co., Inc., Sole Mfrs., 50 Cliff St., New York City

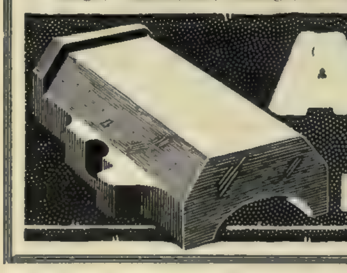
AMERICAN CARBON AND GRAPHITE MOTOR AND GENERATOR BRUSHES are developed to meet the requirements of modern machine design. The electrical characteristics are uniform and are dependable. We guarantee absolute satisfaction.

AMERICAN CARBON & BATTERY CO. E. ST. LOUIS, ILL.

Ajax Car Brasses are distinct money savers on every electric railway. They prevent expensive delays and disorganized schedules by running cool and giving longer and cheaper service. Specify Ajax for new equipment and repairs.

THE AJAX METAL COMPANY

Main Office & Works: Philadelphia, Pa. Established 1880
Southern Plant, Birmingham, Ala.; Offices, New York, Boston, Pittsburgh, Washington, Chicago, St. Louis, San Francisco, Detroit.



AJAX CAR BRASSES

When writing to Advertisers in this publication you will confer a favor on both publisher and advertiser by mentioning the Electric Railway Journal

HIGH TENSION
STEEL TOWER
OUTDOOR
SUB-STATIONS
DELTA STAR ELECTRIC CO CHICAGO
ICE PROOF
POLE TOP
P.M. SWITCHES
ASK FOR TECHNICAL BULLETINS

Samson Bell and Register Cord

Solid braided cotton, extra quality. All sizes and colors. More durable, more economical and better looking than leather or rawhide. Send for samples and full information.

SAMSON CORDAGE WORKS BOSTON, MASS. 2

PROVIDENCE FENDERS **H-B LIFE GUARDS**

The Consolidated Car Fender Co., Providence, R. I.
Manufacturers of The Providence Fender and H-B Life Guard
Wendell & MacDuffie Co., 61 Broadway, New York
General Sales Agents

The "Hycap-Exide" Battery
for
STORAGE BATTERY STREET CARS
THE ELECTRIC STORAGE BATTERY CO
PHILADELPHIA

The Eclipse Railway Supply Co.
CLEVELAND, OHIO
Manufacturers of the
ECLIPSE LIFE GUARD ECLIPSE WHEELGUARD
ECLIPSE TROLLEY RETRIEVER ACME FENDER

The Baldwin Locomotive Works

Philadelphia, Pa.

ELECTRIC MOTOR and TRAILER TRUCKS

STUCKI
SIDE BEARINGS

are truly frictionless. The roller instead of turning on a pin rolls freely like a rolling pin.

A. Stucki Co.
Oliver Bldg.
Pittsburgh, Pa.

CARS FOR SALE
OPEN and CLOSED
MOTOR and TRAIL
Write for Price and Full Particulars to
ELECTRIC EQUIPMENT CO.
Commonwealth Bldg. Philadelphia, Pa.

HORNE RAILWAY DEVICES

Horne Double Acting Brakes
Giant Geared Brakes
Differential Staffless Brakes
Sterling Safety Brakes
Sterling Trolley Bases
Sterling Sand Boxes
Air Rectifiers, eliminating frozen air brake piping
Q-P Trolley Catchers
Lord Screenless Air Cleaners for Compressors
Hydrogrounds and Lightning Arresters
Fenders and Wheelguards
Controller Fingers
Friction and Rubber Tape
Packing and Gaskets
Air Hose and Rubber Specialties

HORNE MANUFACTURING CO., 50 Court St., Brooklyn, N. Y.

UNION SPRING & MFG. CO.
SPRINGS
COIL AND ELLIPTIC
M. C. B. Pressed Steel Journal Box Lids
General Office: First Nat'l Bank Bldg.
PITTSBURGH, PA.
Works: New Kensington, Pa.
50 Church St., New York. 1204 Fisher Bldg., Chicago, Ill.
Missouri Trust Bldg., St. Louis, Mo.

VAN DORN COUPLERS

are made for every condition and requirement. M. C. B. Pin and Link, Car and Air, in all sizes and types.

VAN DORN COUPLER CO.
2325 So. Pauling St., Chicago, Ill.

Rollway Bearings
are Sensible Bearings

If anti-friction bearings were not designed to assure easy installation and replacement by your shopmen, their power, lubrication and inspection savings would not be obtainable in practice.

Rollway Bearings are long past the experimental stage. We *know* just what they can do in city, suburban and interurban service. We offer you a sensible, standard product.

Write us today for service records.

The Railway
Roller Bearing Co.
Syracuse, N. Y.

Steel for Service

Some of the products which this company furnishes for the construction and maintenance of Electric Railways are

Steel Cross Ties
Carnegie Rolled Steel Wheels
Carnegie Axles
Carnegie Rolled Steel Gear Blanks

All of these commodities are of the usual Carnegie standard of excellence.

Carnegie Steel Company
General Offices, Pittsburgh, Pa.
887-A

S-W Shim Slack Adjusters Save Brakeshoes and Labor

SMITH-WARD BRAKE COMPANY, Inc.
17 Battery Place, New York

"Boyerized" Products Reduce Maintenance

Bemis Trucks
Case Hardened Brake Pins.
Case Hardened Bushings
Case Hardened Nuts and Bolts
Manganese Brake Heads
Manganese Transom Plates
Manganese Body Bushings
Bronze Axle Bearings

Bemis Pins are absolutely smooth and true in diameter. We carry 40 different sizes of case hardened pins in stock. Samples furnished. Write for full data.

Bemis Car Truck Co., Springfield, Mass.

SEARCHLIGHT SECTION

IMMEDIATE SHIPMENT

1—500 K.W. Westinghouse Horizontal Turbo Generating Unit wound for 3 phase, 60 cycle, 2300 volts, speed 3600 rpm., condensing duty.

25 Cycle Rotary Converters

2—150 KW. General Electric type T.C., 4-150-750, 25 cycle, 3 ph., 575 volt, rotary converters, 750 rpm., complete with end play and speed limit device.

200 Kilowatt 60 Cycle Rotary Converters

2—200 KW. Westinghouse 3 ph., 60 cy. rotary converters, 550 volts, 720 rpm., complete with 4—100 KW. Westinghouse Scott connected oil insulated transformers, 10,000/9500 volts prim., 430/362 volts secy.

Transformers

6—750 KVA. General Electric oil filled self cooled transformers, 4400/281 volts, with 4400-4290-4180-4070-2200-2090-1980 taps in the primary.
3—500 KW. General Electric, 60 cy., single phase transformers, 66,000 volts primary, 4400/2200 volts secondary.
3—350 KVA. General Electric, type H, 60 cy., transformers 2400/2300/2200 v. prim., 200/400 v. secy.
1—100 KVA. General Electric, type H, 60 cy. transformer, 4600 volts prim., 115-230 volts secy.
3—100 KW. Wagner single phase, 60 cycle, 6600 volts primary, 2050/2300 volts secy., complete with oil.
4—100 KW. Westinghouse. oil insulated, Scott connected transformers, 10,000/9500 v. primary, 430/362 v. secondary.
3—75 KW. Westinghouse 60 cy. transformers, 2200 v. prim., 110/220/440 v. secy.
3—50 KVA. General Electric type H. 60 cy. transformers, 900/1000/16000 v. prim. Y., 230/460 v. secy.
Also a stock of smaller sized transformers.

IMMEDIATE DELIVERY

ARCHER & BALDWIN, Inc.
114-118 Liberty Street New York City
TELEPHONE 4337-4338 RECTOR

STREET CAR MOTORS

10 Westinghouse No. 306. PRACTICALLY NEW—LESS THAN ONE YEAR IN SERVICE.

12 Westinghouse No. 317-A, with gears and pinions. ABSOLUTELY NEW.

CONTROLLERS

38 Gen. Elec. K-10, with handles and brackets.

FREQUENCY CHANGERS

4 1000 KW. SETS:
  Generators: 3 ph., 60 cy., 4500-2300 volts, 300 RPM.
  Motors: 1050 Kva., 3 ph., 25 cy., 6600 volts, 300 RPM.
  Exciters: Direct connected.
  Switchboards: With necessary instruments.
1 100 KW. SET:
  Generator: Sgle. ph., 60 cycle, 2300 volts, 720 RPM.
  Motor: 150 HP., 3 ph., 25 cy., 2300 volts, 720 RPM.
  Exciter: 5 KW., direct connected.

ROTARY CONVERTERS AND MOTOR GENERATOR SETS—25 cycles

1 600 KW. Gen. Elec., TC-A, 3 ph., 600 volt, D.C., 375 volt A.C., 8 pole, 375 RPM.

1 600 KW. set consisting of two 300 KW. 6 pole generators, 550 volts. 600 amps., dir. conn. to one 750 HP. synchronous motor, 3 ph., 25 cy., 6600 volt, 500 RPM., complete with AC and DC panels.

4 500 KW. Gen. Elec., HC-K, 600 volt D.C., 4 pole, 750 RPM., each rotary complete with three 165 Kva. Gen. Elec. OI SC Transformers, HP-RP, 6600/5940 volts prim., 430/286/143 volts sec., also necessary panels and instruments.

1 500 KW. Westg., 3 ph., 550 volt D.C., 390 volt A.C., 6 pole, 500 RPM., with dir. conn. starting motor, AC and DC panels and three 175 KW. Westg. oil cooled transformers, 13,200 volts prim., 390 volts sec.

Our new and complete list of steam and electrical equipment will be mailed upon request

MACGOVERN & COMPANY, Inc.
114 Liberty Street, New York City

10—29′ x 7′ 4″ Jones, seat 26, equipped complete.

10—11 bench, Brill, 33′ x 6′ 8″ sills, 10″ running boards.
7—13 bench, Brill, 37′ x 7′ sills, 10″ running boards.
2—40′ x 8′, seat 40, equipped complete.
6—38′ x 8′, seat 36, equipped complete.
6—52′ x 9′ 6″, seat 46 to 60, combination MCB equipped complete.
1—41′ x 6′ 10″ inside, freight or express complete.
2—Wason snow plows, single truck, double end noses.
40—G. E. 67 motors, 50 K6-K10 controllers.
10—Westinghouse 306, 12 Westinghouse 317A.
10 miles, 60 lb. relaying rail with splices.
10 miles trolley and feeder, 2 miles high tension wire.
2—Electric locomotives.
1—50′ storage battery; 1—30′ and 1—60′ gasoline electric.

CHARLES F. JOHNSON CAR COMPANY
120 Liberty St., New York, N. Y.
Long Distance Phone: Rector 7243

Wanted

Forty Steel Wheels

Forged, Rolled or Cast

Within Forty Days

Diameter, twenty - six inches; tread, three inches wide; flange, seven-eighths inch high.

The Cincinnati Car Co.
Winton Place
Ohio

SEARCHLIGHT SECTION

FOR SALE

Fare Boxes for Sale

40 Johnson registering fare boxes. In excellent operating condition. Greatly reduced prices. For immediate shipment address Nelson P. Hall, Sales Agency, 14 East Jackson Blvd., Chicago, Ill.

Immediate Shipment

100 tons of 62 lb. Shanghai rails, together with bars, rails practically as good as new, ready for quick shipment. Wire for prices.

M. K. FRANK
Frick Building, Pittsburgh, Pa.

If you want

New or Old Steel Rails
Machinery, Cars or Equipment
Write us your needs
Have you seen our new bargain list?

ZELNICKER IN ST. LOUIS

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.

We positively own these Rails and offer same in carload lots and over.

25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.

Immediate shipment guaranteed and prices very attractive.

Carload and less than carload inquiries and orders solicited.

Rails cut to length for structural purposes.

Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Bldg. Pittsburgh, Pa.

CLEVELAND ARMATURE WORKS

Cleveland, Ohio

Everything in the Line of Repairs to Electrical Machinery

Complete Armatures, New Armatures, Rewound Armature Cores, Armature Shafts, Armature Coils, Fields and Commutators.

Established 22 Years.

FOR SALE

Two second-hand

Car Wheel Boring Mills

In good condition.

Apply to The Baltimore Car Wheel Co.,
Baltimore, Md.

Rail Joints

FOR SALE

3,000 pairs

Rail Joint Company's continuous rail joints for 5″ 80 lb. A. S. C. E. Tee Rail, with horizontal drilling 3″-6″ or 3″-9″ respectively, from end of rail, vertical drilling 2 3/16″ from base of rail, holes are drilled for ¾″ track bolts.

Write Buffalo & Lake Erié Traction Company, Erie, Penna.

MISCELLANEOUS WANTS

Wanted at Once

For immediate shipment any quantity of battery lead plates, sediment scrap copper and wire, brass and all other grades of scrap material. Write to us today for our prices. National Metal & Rubber Co., 31 India Wharf, Boston, Mass.

Fare Boxes Wanted

Six second-hand Brill locked fare boxes. Must be good condition. W., 1533 (Miss.), Elec. Ry. Journal, Chicago.

POSITIONS WANTED

HAVE had twelve years' experience in operating and traffic department of important electric railway systems. Am now superintendent of one. Best of references by present and past employers. Capable filling manager's position. P. W., 1513, (Ohio) Elec. Ry. Journal, Chicago.

WANTED

1—200 or 300 ton hydraulic standard

WHEEL PRESS

for hauling car wheels up to 36″ in diameter; 20-solid 12-A Westinghouse

GEARS

68 tooth, 5″ face, which can be bored for 3½″ axle.

Address P. O. Box 557, Auburn, N. Y.

WANTED

Electric Traveling Cranes

One 50-ton; two 20-ton; two 10-ton. State voltage, span, make, age and condition.

CARTER COAL COMPANY
First National Bank Bldg., Cincinnati, O.

POSITIONS WANTED

ELECTRICAL engineer, 34, married, desires position as electrical engineer or superintendent of overhead, 8 years' experience in line construction and maintenance; D.C.; A.C. aerial and underground. Bonding electrolysis. References, present employers. P. W., 1528 (N. Y.), Elec. Ry. Journal, N. Y. C.

MAINTENANCE foreman, married, temperate, 35, experienced in all equipments, city and interurban, desires position as general foreman or master mechanic. References from past and present employers. P. W., 1525 (Ind.), Elec. Ry. Journal, Chicago.

MR. EXECUTIVE: Can you use a young married man, age 29, with proven competent record as motorman, conductor, dispatcher and claim investigator, with 9 years' experience both city and interurban? At present with one of the largest high speed lines in the Middle West, but desirous of a change. Best of reasons and reference. Available 30 days. P. W., 1524 (Mich.), Elec. Ry. Journal, Chicago.

SUBSTATION and overhead superintendent also experienced in shop work. Good interurban record, 18 years' experience, 10 years in last position. P. W., 1520 (Ill.), Elec. Ry. Journal, Chicago.

SUPERINTENDENT—Competent operating executive thoroughly conversant with modern practice. 20 years' experience in high-speed single track and city operation. Now employed, but desirous of assuming greater responsibilities. Correspondence solicited. P. W., 1535 (N. Y.), Elec. Ry. Journal, N. Y. C.

POSITIONS VACANT

ARMATURE winder and electrician familiar with general maintenance and capable of taking charge of rolling stock, small road, twelve cars. Give experience and salary. Married man preferred. P., 1531 (Mich.), Elec. Ry. Journal, Chicago.

ALL-ROUND carbarn foreman wanted. Also all-round pitmen who must understand car equipment electrically as well as mechanically. P., 1534 (Mass.), Elec. Ry. Journal, N. Y. C.

EXPERT armature winder and electrician who is familiar with general maintenance and capable of taking charge of rolling stock of small road wanted. Give experience, references, salary, date can report, photo, and all other needed information in first letter. Address P. 1517 (Ill.), Elec. Ry. Journal, Chicago.

WORKING car barn foreman and chief electrician wanted. Must be familiar with Westinghouse equipment, know how to rewind and repair motors, and keep car equipment and bodies in first class condition. Would prefer man who is also competent to repair transformers and induction motors. Desirable position with first class company operating twelve cars and doing a general light and power business. Tell all in first letter—age, married or single, full experience, references and salary required. Address Jackson Railway & Light Co., Jackson, Tenn.

EMPLOYMENT AGENCIES

Correspondence Service

The undersigned provides a confidential service designed to locate openings through correspondence for men earning not less than $2,500 and up to $25,000; all lines. Not an employment agency, but a constructive, initiative service, covering individual negotiations. Established 1910. Complete privacy assured; present connections in no way jeopardized. Send name and address only for explanatory details. R. W. Bixby, H1 Niagara Square, Buffalo, N. Y.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

More than 300 different products are here listed.
The Alphabetical Index (see eighth page following) gives the page number of each advertisement.
As far as possible advertisements are so arranged that those relating to the same kind of equipment or apparatus will be found together.

This ready-reference index is up to date, changes being made each week.
If you don't find listed in these pages any product of which you desire the name of the maker, write or wire Electric Railway Journal, and we will probably furnish the information.

Acetylene Apparatus. (See Cutting Apparatus, Oxy-Acetylene.)

Acetylene Service.
Oxweld Acetylene Co.
Prest-O-Lite Co., Inc., The.

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Horne Mfg. Co.

Alloys and Bearing Metals. (See Bearings and Bearing Metals.)

Alloys, Steel and Iron.
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Automobiles and Buses.
Brill Co., The J. G.

Axles.
National Tube Co.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The

Bankers and Brokers.
National City Co.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
More-Jones Brass & M. Co.
Post & Co., E. L.
St. Louis Car Co.
Westinghouse Elec. & M. Co.

Bearings, Center.
Baldwin Locomotive Works.
Holden & White, Inc.

Bearings, Oilless, Graphite, Bronze and Wood.
Bound Brook Oil-less Bearing Co.

Bearings, Roller and Ball.
Gurney Ball-Bearing Co.
Railway Roller Bearing Co.

Bearings, Roller Side.
Holden & White, Inc.
Stucki Co., A.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Zelnicker Sup. Co., W. A.

Blow Torches for Soldering and Brazing. (See Cutting Apparatus, Oxy-Acetylene.)

Blowers.
General Electric Co.
Westinghouse Elec. & M. Co.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Dearborn Chemical Co.

Boiler Tubes.
National Tube Co.

Bond Clips.
Electric Railway Improvement Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improvement Co.
Ohio Brass Co.
Oxweld Acetylene Co.
Prest-O-Lite Co., Inc., The.

Bonding Tools.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Bonds, Welded.
Lincoln Bonding Co.

Book Publishers.
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Etc.)
Bates Expanded Steel Truss Co.
Electric Railway Equipment Co.
Electric Service Supplies Co.
Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.
Union Electric Co.

Brake Adjusters.
Holden & White, Inc.
Smith-Ward Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdy. Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Long Co., E. G.
St. Louis Car Co.

Brakes, Brake Systems and Brake Parts.
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Westinghouse Trac. B. Co.

Brooms, Track, Steel or Rattan.
Zelnicker Supply Co., W. A.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.

Brushes, Carbon.
American Carbon & Battery Co.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
Dixon Crucible Co., Jos.

Bumpers, Car Seat.
Electric Service Supplies Co.

Bushings, Case Hardened and Manganese.
Bemis Car Truck Co.

Bushings, Fibre.
Diamond State Fibre Co.

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Pantasote Co., The.

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Brill Co., The J. G.
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St. Louis Car Co.

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MacGovern & Co., Inc.

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Hartshorn Co., Stewart.

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Brill Co., The J. G.
Electric Service Supplies Co.

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Shovels, Power.
Allis-Chalmers Mfg. Co.

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Electric Service Supplies Co.
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Signals, Highway Crossing.
Electric Service Supplies Co.
Nachod Signal Co., Inc.

Skylights, Steel Puttyless.
Drouvé Co., The G.

Slack Adjusters. (See Brake Adjusters.)

Sleet Wheels and Cutters.
Anderson Mfg. Co., A. & J. M.
Bonney-Vehslage Tool Co.
Columbia M. W. & M. I. Co.
Drew Electric & Mfg. Co.
Holden & White, Inc.
More-Jones Brass & M. Co.
Nuttall Co., R. D.

Snow-Plows, Sweepers and Brooms.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Consolidated Car Fender Co.

Soaps.
Sherwin-Williams Co.

Solder and Solder Flux.
Westinghouse Elec. & M. Co.

Soldering and Brazing Apparatus. (See Welding, Processes and Apparatus.)

Spikes.
American Steel & Wire Co.
Lackawanna Steel Co.

Splicing Compounds.
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Standard Woven Fabric Co.
Westinghouse Elec. & M. Co.

Splicing Sleeves. (See Clamps and Connectors.)

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Brill Co., The J. G.
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Storage Batteries. (See Batteries, Storage.)

Straps, Car, Sanitary.
Holden & White, Inc.
Railway Improvement Co.

Structural Iron. (See Bridges.)

Sub Stations.
Delta Star Electric Co.

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Sweepers, Snow. (See Snow Plows, Sweepers & Brooms.)

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Switches, Track. (See Track, Special Work.)

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Electric Service Supplies Co.

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Hunt & Co., Robert W.

Testing Instruments. (See Instruments, Electrical Measuring, Testing, etc.)

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Gold Car Heating & Lighting Co.
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Smith Heater Co., Peter.

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McCardell & Co., J. R.

Track, Special Work.
Cleveland Frog & Cross. Co.
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Kilby Frog & Switch Co.
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Transfers. (See Tickets.)

Transfer Tables.
Archbold-Brady Co.

Transformers.
Allis-Chalmers Mfg. Co.
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Packard Electric Co.
Westinghouse Elec. & M. Co.

Treads, Safety, Stairs, Car Step.
American Mason S. T. Co.
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Trolley Bases.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
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Horne Mfg. Co.
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Nuttall Co., R. D.
Ohio Brass Co.
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Ford Chain Block & Mfg. Co.

Trolley Shoes.
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Trolley Wheels. (See Wheels, Trolley.)

Trucks, Car.
Baldwin Locomotive Works.
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Brill Co., The J. G.
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National Tube Co.

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Allis-Chalmers Mfg. Co.
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Allis-Chalmers Mfg. Co.

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National Tube Co.
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Varnishes. (See Paints, etc.)

Ventilators, Building.
Drouvé Co., The G.

Ventilators, Car.
Brill Co., The J. G.
Globe Ventilator Co.
Holden & White, Inc.
Railway Utility Co.
St. Louis Car Co.

Vestibules, Portable.
Brill Co., The J. G.

Voltmeters. (See Instruments.)

Washers.
Bound Brook Oil-less Bearing Co.
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Oxweld Acetylene Co.
Prest-O-Lite Co., Inc., The.
Westinghouse Elec. & M. Co.

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Wheel Presses. (See Machine Tools.)

Wheels, Car, Cast Iron.
Bemis Car Truck Co.
Long Co., E. G.

Wheels, Car, Steel and Steel Tired.
Bemis Car Truck Co.
Carnegie Steel Co.
Standard Steel Works Co.

Wheels, Trolley.
Anderson Mfg. Co., A. & J. M
Bound Brook Oil-less Bearing Co.
Columbia M. W. & M. I. Co.
Electric Materials Co.
Electric Service Supplies Co.
Eureka Co.
General Electric Co.
Holden & White, Inc.
Long Co., E. G.
More-Jones Brass & M. Co.
Nuttall Co., R. D.
Star Brass Works.
Union Electric Co.

Whistles, Air.
General Electric Co.
Ohio Brass Co.

Winding Machines. (See Coil Banding and Winding Machines.)

Window Operators.
Drouvé Co., The G.

Wire Rope.
American Steel & Wire Co.
Roebling's Sons Co., John A.

Wires and Cables.
Aluminum Co. of America.
American Steel & Wire Co.
Bridgeport Brass Co.
D & W Fuse Co.
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Roebling's Sons Co., John A.
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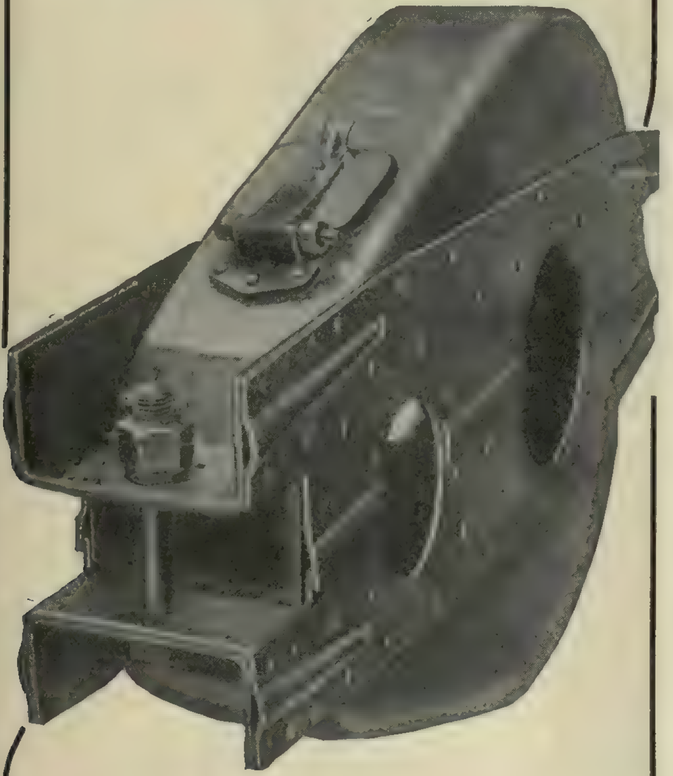

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If proofs before printing are required, change of copy and copy for new advertisements must be in our hands 10 days in advance of the date of publication.

A

Page

Ajax Metal Co. 46
Allis-Chalmers Mfg. Co. 34
Aluminum Co. of America 38
Amer. Brake Shoe & Fdry. Co. 37
American Car Co. 61
American Carbon & Battery Co. 46
American Mason S. T. Co. 45
American Steel & Wire Co. 40
Anderson Mfg. Co., A. & J. M. 32
Archbold-Brady Co. 38
Archer & Baldwin, Inc. 48
Arnold Co., The 30
Arthur Power-Saving Recorder Co., The 20, 21

B

Babcock & Wilcox Co. 41
Baldwin Locomotive Works, The 47
Bates Expanded Steel Truss Co. 39
Beeler, John A. 30
Bemis Car Truck Co. 47
Bonham Recorder Co. 43
Bonney-Vehslage Tool Co. 43
Bound Brook Oil-less Bearing Co. 45
Bridgeport Brass Co. 10
Brill Co., The J. G. 61
Buckeye Jack Mfg. Co. 41
Byllesby & Co., H. M. 30

C

Cameron Electrical Mfg. Co. 42
Canton Culvert & Silo Co. 40
Carnegie Steel Co. 47
Carney & Co., B. J. 38
Cincinnati Car Co. 48
Cleveland Armature Works 49
Cleveland Fare Box Co. 44
Cleveland Frog & Crossing Co. 40
Collier, Inc., Barron G. 55
Columbia M. W. & M. I. Co. 26
Consolidated Car Fender Co. 46
Cooper Heater Co., The 44
Crouse-Hinds Co. 19
Cutter Co., The 42

D

D & W Fuse Co. 42
Daum, A. F. 42
Dearborn Chemical Co. 46
Delta Star Electric Co. 46
Diamond State Fibre Co. 38
Dixon Crucible Co., Joseph 42
Drew Elec. & Mfg. Co. 33
Drouvé Co., The G. 32
Drum & Co., A. L. 30
Duff Manufacturing Co., The 42

E

Eclipse Ry. Supply Co. 46
Economy Fuse & Mfg. Co. 35
Electric Equipment Co. 47
Electric Materials Co., The 39

Page

Electric Railway Equipment Co. 8
Electric Railway Improve. Co. 16
Electric Railway Journal 12
Electric Service Supplies Co. 11
Electric Storage Battery Co. 46
Elec'l Testing Laboratories 30
Eureka Co. 43

F

Federal Signal Co. 38
Ford, Bacon & Davis 30
Ford Chain Block & Mfg. Co. 43
"For Sale" Ads 48, 49
Frankel Connector Co. 39

G

Galena-Signal Oil Co. 24
General Electric Co. .. 28, Back Cover
Globe Ventilator Co. 45
Gold Car Heating & Lighting Co. 44
Goldschmidt Thermit Co. 17
Green Eng'g Co. 42
Gurney Ball Bearing Co. 60

H

Hale & Kilburn Co. 44
Hartshorn Co., Stewart 43
"Help Wanted" Ads 48, 49
Holden & White, Inc. 45
Horne Mfg. Co. 47
Hubbard & Co. 38
Hunt & Co., Robert W. 30

I

Independent Lamp & Wire Co. 51
Ingersoll-Rand Co. 53
International Register Co., The 23
International Steel Tie Co., The. 9

J

Jackson, D. C. & Wm. B. 30
Jeandron, W. J. 53
Jewett Car Co. 36
Johnson Car Co., Chas. F. 48
Johnson Fare Box Co. 22
Jordan Bros., Inc. 43

K

Kilby Frog & Switch Co. 41
Kinnear Mfg. Co. 43
Klein & Sons, Mathias 42
Kuhlman Car Co., G. C. 61

L

Page

Lackawanna Steel Co. 15
Lincoln Bonding Co. 40
Lindsley Bros. Co. 38
Little, Inc., Arthur D. 30
Long Co., E. G. 53

M

McCardell & Co., J. R. 38
McGraw-Hill Book Co., Inc. 31
MacGovern & Co., Inc. 48
Mechanical Rubber Co. 34
Miller Trolley Shoe Co. 18
More-Jones Brass & Metal Co. 33
Morgan Crucible Co. 57
Murphy Iron Works 42

N

Nachod Signal Co., Inc. 39
National Brake Co. 29
National City Co. 30
National Railway Appliance Co. 51
National Tube Co. 38
Nelsonville Brick Co. 41
New York Switch & Cross. Co. 40
Niles-Bement-Pond Co. 35
Nuttall Co., R. D. 45

O

Ohio Brass Co. 7
Oxweld Acetylene Co. 41

P

Packard Electric Co. 42
Page Woven Wire Fence Co. 38
Pantasote Co., The 43
Patten Co., Paul B. 44
Perey Mfg. Co., Inc. 44
"Positions Wanted" Ads 49
Post & Co., Inc., E. L. 46
Power Specialty Co. 41
Prest-O-Lite Co., Inc., The., Front Cover
Publisher's Page 12

R

Railway Improvement Co. 27
Railway Roller Bearing Co. 47
Railway Track-work Co. 14
Railway Utility Co. 45
Ramapo Iron Works 39
Richey, Albert S. 30

Page

Roebling's Sons Co., John A. 39
Roller Lock Nut Co. 36
Rooke Automatic Register Co. 43

S

St. Louis Car Company, The 37
Samson Cordage Works 46
Sanderson & Porter 30
Sangamo Electric Co. 44
Scofield Engineering Co. 30
Searchlight Section 48, 49
Second Hand Equip 48, 49
Sherwin-Williams Co., The 43
Simmen Automatic Railway Signal Co. 38
Smith Heater Co., Peter 44
Smith-Ward Brake Co. 47
Standard Paint Co. 42
Standard Steel Works Co. 37
Standard Underground Cable Co. 38
Standard Woven Fabric Co. 43
Star Brass Works 45
Stephenson Co., John 61
Stone & Webster Eng'g Corp. 30
Stucki Co., A. 47

T

Thayer & Co., Inc. 57
Titanium Alloy Mfg. Co. 59
Tool Steel Gear & Pinion Co. 25

U

Union Electric Co. 40
Union Spring & Mfg. Co. 47
Universal Safety Tread Co. 45

V

Van Dorn Coupler Co. 47

W

"Want" Ads 49
Wason Mfg. Co. 61
Western Red Cedar Assn. 13
Westinghouse Elec. & Mfg. Co., 2, 4, 5
Westinghouse Traction Brake Co. 6
Weston Elec'l Instrument Co. 51
White Companies, The J. G. 30
Wisch Service, The P. Edw. 56
Wood Co., Chas. N. 38
Woodmansee & Davidson, Inc. 30

Z

Zelnicker Supply Co., Walter A. 49

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117

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R. G. Taber on Dallas (Texas) Track Construction

ELECTRIC RAILWAY JOURNAL

ew York, June 23, 1917 McGraw-Hill Publishing Co., Inc. Vol. 49, No. 25 10c a copy

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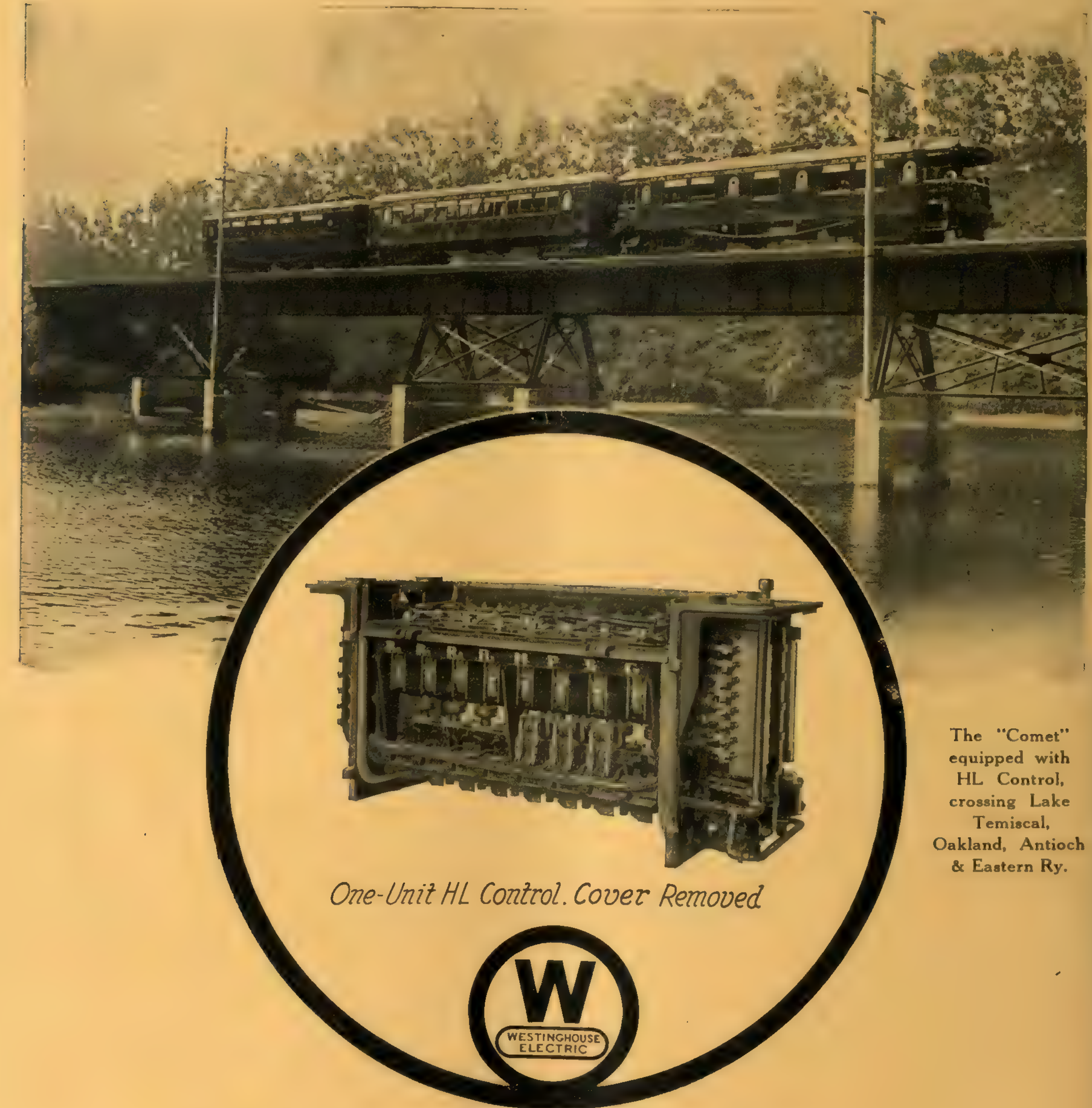

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ELECTRIC RAILWAY JOURNAL

H. W. BLAKE, Editor

VOLUME XLIX, NO. 25 NEW YORK, JUNE 23, 1917 PAGES 1125 TO 1172

CONTENTS

What Shall We Do to Lighten the Paving Burden?

R. C. Cram sums up the repaving situation and summons authorities to prove the injustice of the historic but outgrown tax. He cites some convincing data from Brooklyn..............................Page 1130

A Modern Type of Track Construction

Welded joints, steel ties and tile drainage system play important parts in new track work. R. G. Taber describes the methods employed in rebuilding the recently completed double-track system of the Dallas Consolidated Electric Street Railway.........................Page 1137

How Costs of Rendering Service Are Steadily Rising

Ivy L. Lee compares reports from a number of electric railway companies in all sections of the country which show marked increase in materials and labor. Statistics are given. The effect of the war.......Page 1139

EQUIPMENT AND ITS MAINTENANCE....1149

Track Paving Construction in Seattle, Wash.—*By S. E. Goodwin.*
Winding Heater Motor Armatures.
Simplified System for Stockroom Storekeeping—*By W. D. Pieri.*
Storing Poles for Easy Loading.
Locomotive Cranes of Pacific Electric Railway—*By Clifford A. Elliott.*
Georgia Railway & Power Company has Home-Made Outdoor Substations.
Operating Rotaries Without Compounding on a 1200-Volt Heavy Railway—*By E. R. Cunningham.*
How to Burn Anthracite Buckwheat Instead of Bituminous Coal in a Small Railway Plant.
Flexible Joint Remedies Turnbuckle Brake-Rod Failures.

EDITORIALS 1125

"Co-operating" with the Commission.
The Present Status of the Paving Tax.
Employment of Women Is Inevitable.
Robbing Peter to Pay Paul.
Courtesy and Service.
Settle the Status of the Manufacturer.
What Is Ahead of the Electric Railway Industry?

CO-OPERATION BETWEEN TRANSPORTATION AND EQUIPMENT DEPARTMENTS.......1135

INCREASE IN EARNINGS...............1135

REVIEW OF WORKINGMEN'S COMPENSATION ACTS 1138

NEW HAVEN TO CURTAIL SCHEDULE....1138

WAR PREPARATIONS EFFECT TRAFFIC INCREASE 1141

EIGHT TRANSFERS FOR FIFTY-TWO.......1141

THIRD AVENUE OPENS FARE CASE......1142

HAVE THE NEW YORK COMMISSIONERS POWER TO INCREASE FARES?.........1145

COMMUNICATIONS 1148

AMERICAN ASSOCIATION NEWS..........1148

NEWS OF ELECTRIC RAILWAYS..........1155

Mayor on St. Louis Controversy.
Rapid Transit Commission Suggested.
Chicago Legislation Lost.
Strike in Dayton.
Strike Investigation Closed.
Strike in Vancouver.
Columbus Suburban Franchise.
Baltimore Promotes Social Activities.
Public Utilities in Russia.

FINANCIAL AND CORPORATE............1159

Electric Railway Statistics.
Columbus, Delaware & Marion Sold.
Platform of Investors' Protective Association.

TRAFFIC AND TRANSPORTATION 1163

I. C. C. Powers Questioned.
Kansas City Fare Hearing.
Electric Lines Relieve Traffic.
Mr. McCulloch Reviews Conditions.
Seattle Seeks Jitney Regulation.
Improvements Made in Buffalo.

PERSONAL MENTION 1165

CONSTRUCTION NEWS 1167

MANUFACTURES AND MARKETS 1169

JAMES H. MCGRAW, President
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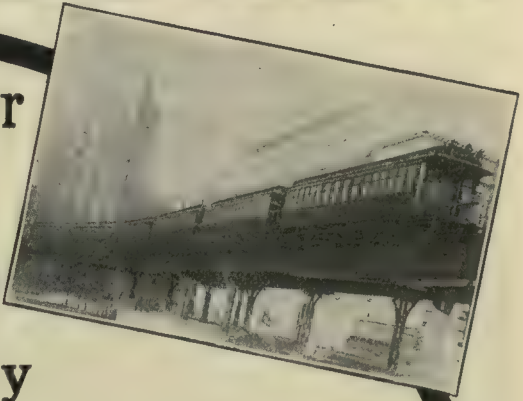
Westinghouse

From the Horse-car to Electric Transportation



New York City

The breach between the horse car and electric transportation is **vast,** yet the transition took place within a comparatively few years.

Picture, if you can, the gigantic electrical machinery **now** furnishing power to the thousands of surface, elevated and subway cars in New York City with its six million people.

In performing this task, the Interborough Rapid Transit Company employs a large number of—

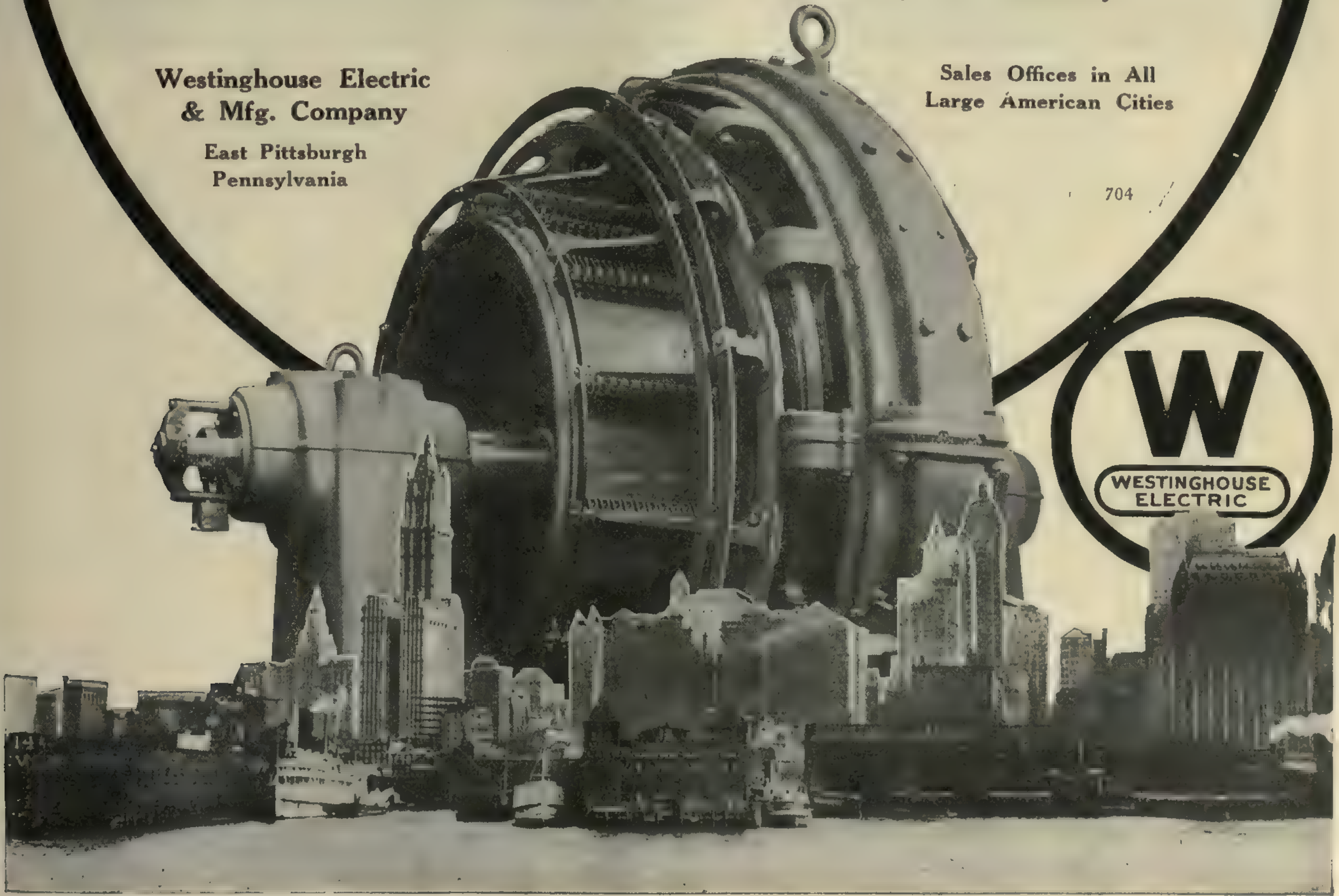
Westinghouse Railway Converters

Recent additional orders include twenty 4000 kw., 60-cycle units. You will find the name "Westinghouse" figuring prominently in all engineering problems requiring equipment of the highest standard of reliability and efficiency.

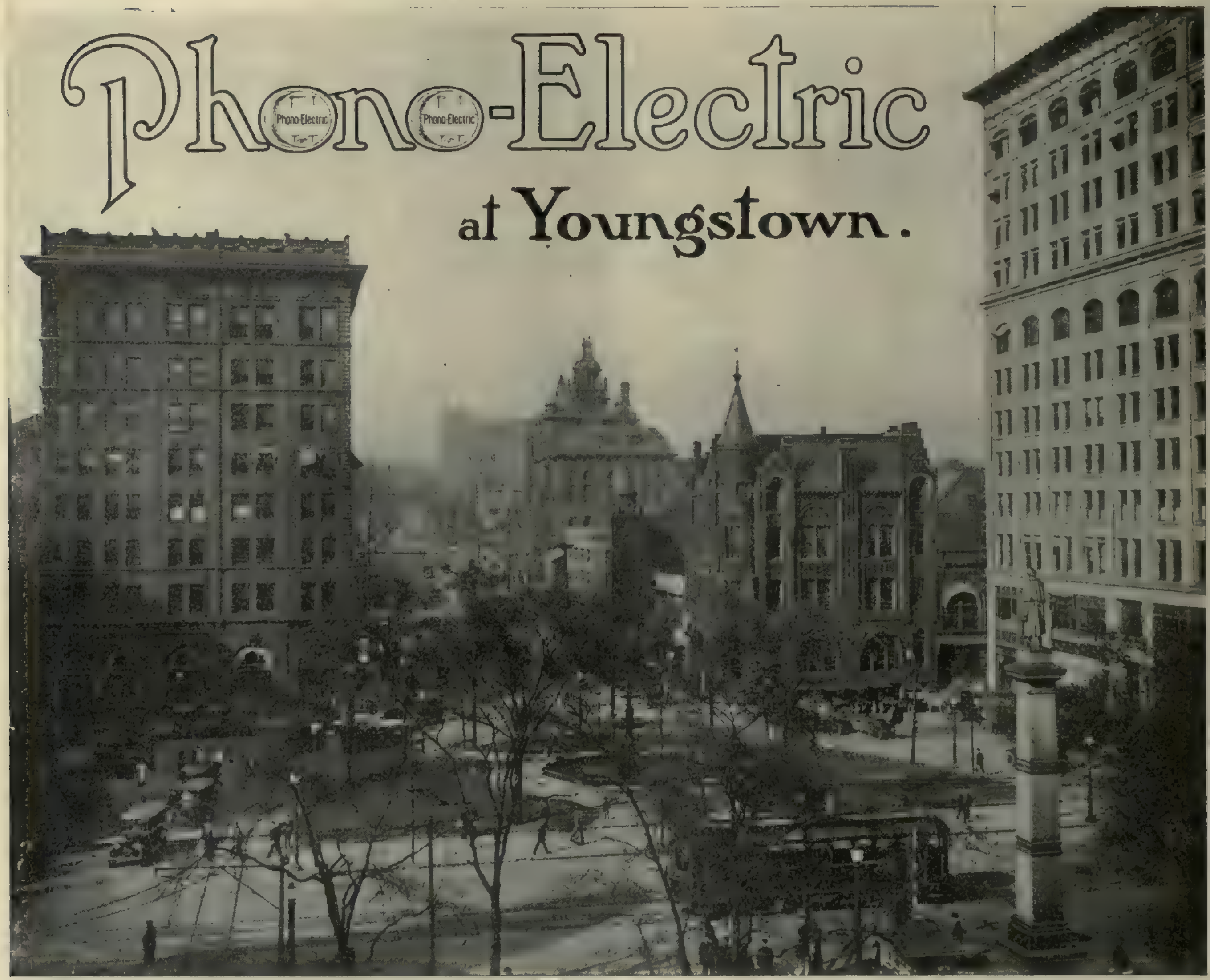
Westinghouse Electric & Mfg. Company
East Pittsburgh
Pennsylvania

Sales Offices in All Large American Cities

704



W
WESTINGHOUSE ELECTRIC



"For Places of Particular Stress"

When we asked a representative of the Mahoning & Shenango Railway & Light Company where his company used Phono-Electric, he said, as a matter of course:

"For Curves and Other Places of Particular Stress on the System."

The Mahoning & Shenango is now operating 500 cars a day under Phono-Electric Trolley Wire at the Public Square, Youngstown. Coincident with the great improvement work undertaken two years ago, it began to use Phono-Electric Trolley Wire.

Phono-Electric replacement of copper is a natural part of electric railway improvement work because its durability insures uninterrupted service for transportation as well as ultimate economy for engineering.

Bridgeport Brass Company
Bridgeport Connecticut

2042

(Patented)

O-B Trolley Retrievers Stay on the Cars

In O-B Retrievers simplicity has been attained without sacrifice of any desirable operating features.

So when the pole jumps the O-B Retriever pulls it back quickly, surely, every time.

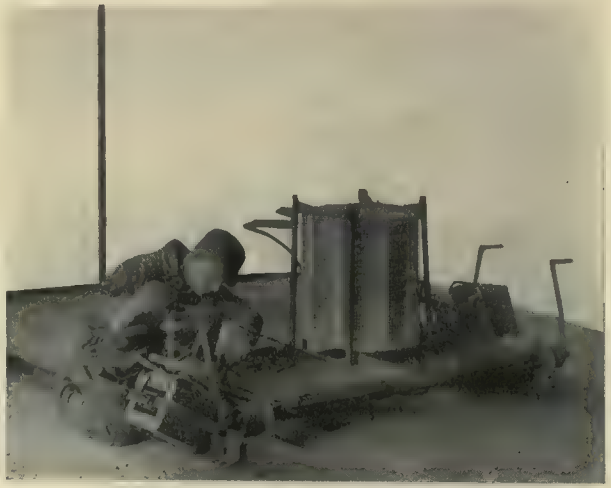
And because of its simple, rugged construction it is practically trouble-proof. It is always ready for service—a veritable stranger in the repair shop.

You can prove these facts. Write for an O-B Retriever on trial.

Described on page 578 catalog No. 16.

The Ohio Brass Co.

Mansfield, Ohio



ERICO
Welded
Rail Bond
QUALITY

is what every manufacturer of welded rail bonds is trying to furnish you.

Why Not Buy the Real Thing?

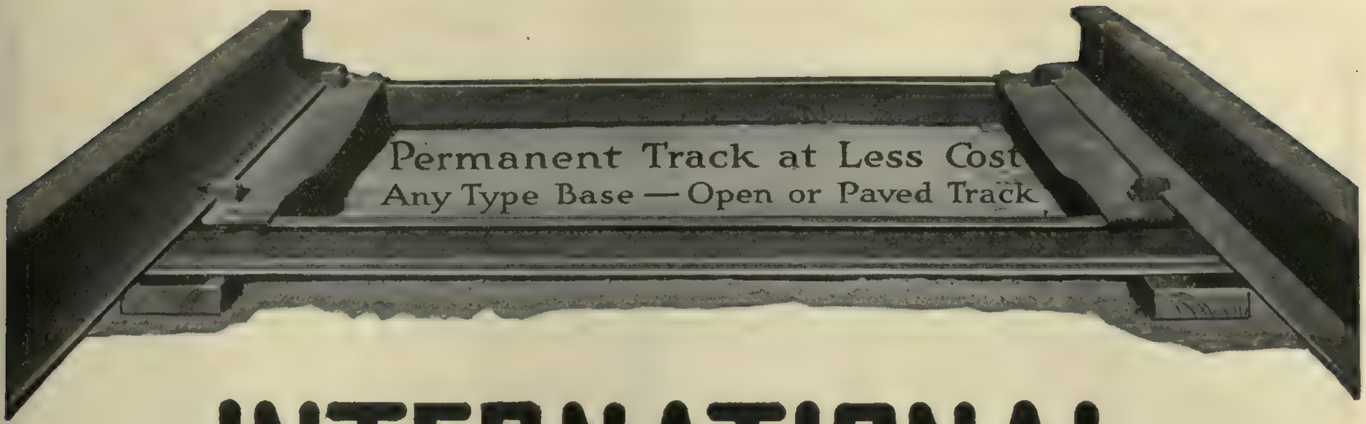
It can be had by small roads and large by using the

ERICO
Portable Welder

This outfit is low priced and is easily portable so it will not interfere with schedules. It is the ideal portable outfit for both large and small roads.

ERICO
THE LINE OF LEAST RESISTANCE

The Electric Railway Improvement Co.
Cleveland


Permanent Track at Less Cost
Any Type Base — Open or Paved Track

INTERNATIONAL
STEEL TWIN TIES
Cut Rehabilitation Costs

In these days of the diminishing nickel you must build for permanence—track construction must be an investment, not an expense.

You can't afford to tear up your track foundation every time the rails need replacement. You don't have to if you construct with International Steel Twin Ties.

When International Ties are once installed your foundation and tie costs are ended. To replace worn rails simply remove the wedges and clips, replace old rails and put the clip back in place. You needn't worry about the ties and foundation. They're built to last, they stay put, and no man has ever known them to fail.

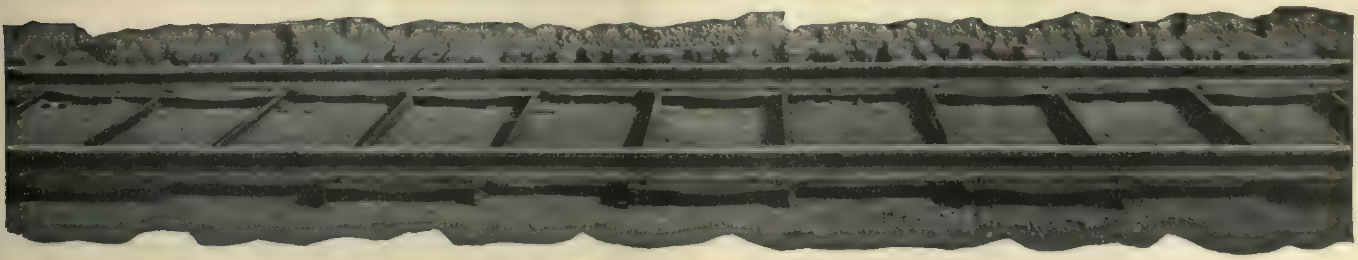
Permanent construction with International Steel Ties costs less than wood tie construction—$1000 to $6000 per mile less.

Let us submit comparative estimates on your job
Prompt deliveries made from stock

The International Steel Tie Company
Manufacturers of Steel Twin Ties and Crossing Foundations
General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co., Los Angeles, Cal.
San Francisco, Cal. Seattle, Wash.
R. J. Cooper Co., Salt Lake City, Utah.
J. E. Lewis & Co., Dallas, Texas.
Maurice Joy, Philadelphia.
William H. Ziegler, Minneapolis, Minn.



Catch the Bad Track Spot When It's Young —That's the Best Economy

Cupped joints and corrugations in track are no respectors of youth.

Merely because track is new is no assurance that these bad spots will not quickly develop in it.

Ample experience shows that track which has been laid only a few months is just as apt to require "treatment" as track that has been in service for years.

If you will put the

Reciprocating Track Grinder

at work when these bad spots in rails **first begin** to make themselves evident you will not only keep your rails in constantly good condition but you will save money in the long run. Because you will find less grinding necessary than if you allow the trouble to go deep and you will not find it necessary to grind away so much of the wearing surface, which is, of course, the life of the rail.

You can determine exactly what a Reciprocating Grinder can do for you at our expense.

Procrastination simply adds to your ultimate expense.

Railway Track-work Co.

30th and Walnut Streets, Philadelphia

What is expected of this Rail Bond?

Showing Their Great Number of Flexible Strands

Showing the Protection Afforded the Strands by the "Shot-Over" Sleeve

Primarily, it must assure a return circuit of maximum electrical conductivity.

This track illustrated is bonded with

"Protected" Rail Bonds

They are specially designed to everlastingly perform this duty, because—

They have "Shot-Over" Sleeves which protect the strands from the effects of vibration where they emerge from the terminal.

They have many strands of pure lake copper which further help to absorb vibration.

They have lugs of soft, pure, ductile copper which, as you know, is best for compressing into the rail.

They form a broad line of bonds for every service.

Always use "Protected" Bonds.

Write for catalog.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

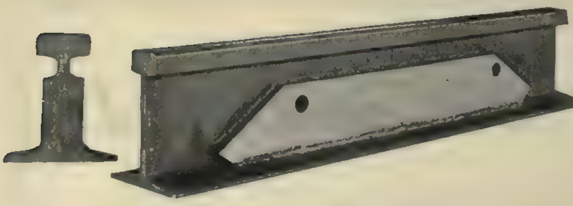
Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto

Notice!

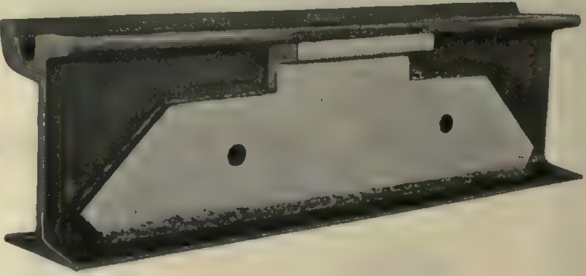
At an increase of 100%
over the present price of

Indianapolis Welders Steel and Joints

they would still be the most economical and effectual means of Maintenance of Track and Rolling Stock.



"Simplex" Joint for High Tee Rail



"Apex" Joint: Supporting Head on Gage Side for Guard and Girder Rail

We have not taken advantage of War Prices

Steel and other materials in manufacturing lines have advanced from 100% to 300% over 1912.

Our Prices:

WELDERS, same as 1912—$500.00.
WELDING STEEL only 25% over 1912.
WELDING JOINTS only 70% over 1912.

We offer immediate shipment of Welders and Steel Joints on short notice.

Indianapolis Switch & Frog Company

Springfield, Ohio

Pure and Durable Iron

Nails from the old Fairbanks House at Dedham, Mass.—in service 275 years. Analysis shows 99.841% Pure Iron—very low contents of Sulphur, Carbon, Copper and Manganese.

At the meeting of the Canadian Railway Club at Montreal, in December, 1915, Mr. W. E. Ramsay, Construction Engineer of the Canadian Pacific Railway, stated, during a discussion of durability of iron and steel—

"I have in my hand a piece of band iron which I presume is 12 gauge and which was used in the construction of a flume in Ontario in 1861. It was removed in 1913, and you can see by examination that the deterioration has been uniform both on the exposed portion of the band and the side that was next to the wooden flume. This piece of iron was exposed to the atmosphere for over fifty years, and while the deterioration is not very great, this iron shows a purity equal to any iron manufactured in the world today.

"I further believe that the care taken in making the basic materials used fifty years ago is the reason for the durability of this iron. Fifty-three years exposed on both sides and no paint! The analysis is 99.87% pure iron against impurities."

The material of "Armco" Iron Corrugated Culverts is iron which is guaranteed never to contain more than 16/100 of one per cent of impurities. The average actual content is considerably less. In physical evenness it is actually superior to the fine old metal of our grandfathers' times. It is The Iron That's Made to Last.

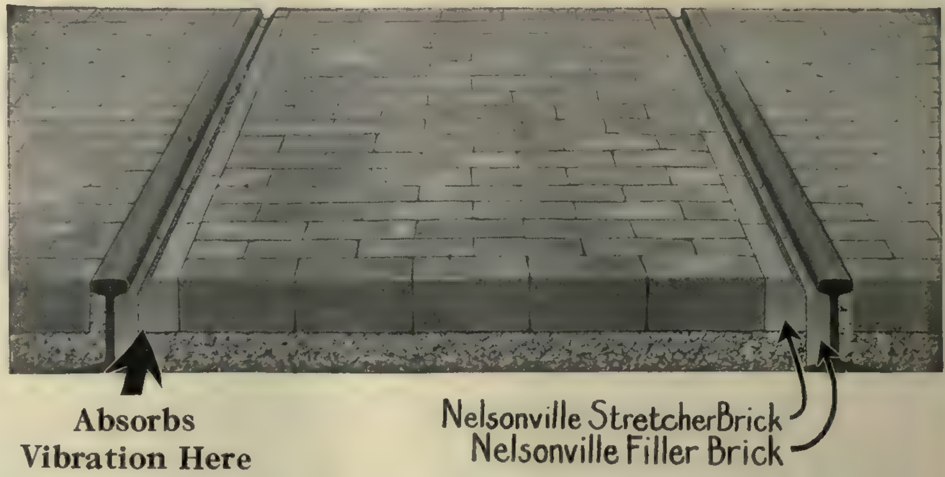
AMERICAN ARMCO INGOT IRON

Resists Rust

A postal to the Nearest Manufacturer will bring full information on "Armco" Iron Culverts, Flumes, Gates, Sheets, Roofing and Formed Products.

Arkansas, Little Rock
Dixie Culvert & Metal Co.
California, Los Angeles
California Cor. Culvert Co.
California, West Berkeley
California Cor. Culvert Co.
Colorado, Denver
R. Hardesty Mfg. Co.
Delaware, Clayton
Delaware Metal Culvert Co.
Florida, Jacksonville
Dixie Culvert & Metal Co.
Georgia, Atlanta
Dixie Culvert & Metal Co.
Illinois, Springfield
Illinois Corrugated Metal Co.
Indiana, Crawfordsville
W. Q. O'Neall Co.
Iowa, Des Moines
Iowa Pure Iron Culvert Co.
Iowa, Independence
Independence Culvert Co.
Kansas, Topeka
The Road Supply & Metal Co.
Kentucky, Louisville
Kentucky Culvert Co.
Louisiana, New Orleans
Dixie Culvert & Metal Co.
Maryland, Munsey Bldg., Baltimore
Wm. M. Baker.
Massachusetts, Palmer
New England Metal Cul. Co.
Michigan, Bark River
Bark River Bridge & Cul. Co.
Michigan, Lansing
Michigan Bridge & Pipe Co.
Minnesota, Minneapolis
Lyle Corrugated Culvert Co.
Minnesota, Lyle
Lyle Corrugated Culvert Co.
Missouri, Moberly
Corrugated Culvert Co.
Montana, Missoula
Montana Culvert & Flume Co.
Nebraska, Lincoln
Lee-Arnett Co.
Nebraska, Wahoo
Nebraska Culvert & Mfg. Co.
Nevada, Reno
Nevada Metal Mfg. Co.
New Hampshire, Nashua
North-East Metal Culvert Co.
New Jersey, Flemington
Pennsylvania Metal Culvert Co.
New York, Auburn
Pennsylvania Metal Culvert Co.
North Dakota, Wahpeton
Northwestern Sheet & Iron Wks.
Ohio, Middletown
The Ohio Corrugated Culvert Co.
American Rolling Mill Co.
Oklahoma, Shawnee
Dixie Culvert & Metal Co.
Oregon, Portland
Coast Culvert & Flume Co.
Pennsylvania, Warren
Pennsylvania Metal Culvert Co.
South Dakota, Sioux Falls
Sioux Falls Metal Culvert Co.
Tennessee, Nashville
Tennessee Metal Culvert Co.
Texas, Dallas
Wyatt Metal Works.
Texas, El Paso
Western Metal Mfg. Co.
Texas, Houston
Lone Star Culvert Co.
Utah, Woods Cross
Utah Corrugated Cul. & Flume Co.
Virginia, Roanoke
Virginia Metal Culvert Co.
Washington, Spokane
Spokane Cor. Culvert & Tank Co.
Wisconsin, Eau Claire
Bark River Bridge & Culvert Co.

Canada—Canada Ingot Iron Co., Ltd., Guelph, Sherbrooke, Winnipeg, Calgary



The "T" RAIL *TRAIL*

would have followed every city car track if Nelsonville Filler and Stretcher brick had been invented a little earlier.

As it IS:—Nelsonville Filler and Stretcher brick makes track laid with the old reliable T rail permanently smooth and tight.

There are no "kick-ups" any more.

Girder Rail cannot compete in low cost or efficiency with T rail together with

Nelsonville
Filler and Stretcher
Brick

(Patented)

They are laid WITHOUT GROUTING, and they positively absorb vibration and shock.

They are the shortest way of obtaining a permanent, tight and level pavement with the minimum of paving repairs.

Let us send you
a copy of
"Rail Brick of the
Right Sort."

THE NELSONVILLE BRICK CO.
Nelsonville, Ohio

The Man Behind the Engine

Is Your Contact with the Public

Passengers naturally judge a railway by the efficiency of the representatives they meet every day—the conductor and the motorman.

Conductors and motormen naturally are more efficient when provided with the best possible tools for their jobs.

And the best possible tools for promoting efficient handling of passengers at steps, doors and vestibules are

National Pneumatic Control or National Manual Control, depending upon the nature of the service.

NATIONAL PNEUMATIC COMPANY

50 Church St. New York

515 Laflin St. Chicago

Hale and Kilburn The Spring-Edge Cushion

Hale & Kilburn seats are made to give 100 per cent comfort to the passenger—from the shoulders to the tendons of the inner side of the knee.

Hence the pains taken by us to provide a broad, flat, elastic edge to cap the springs of the cushion—

Thereby preventing sharp edges which would cause discomfort—

And securing a truly flexible, non-denting "come-back" construction entirely unlike the old-fashioned wire edge, with its tendency to bend and "set."

This is but one of many traffic-building features of Hale & Kilburn No. 300-FE seats, as used for high-class interurban railways. It will pay you to study our seats in detail.

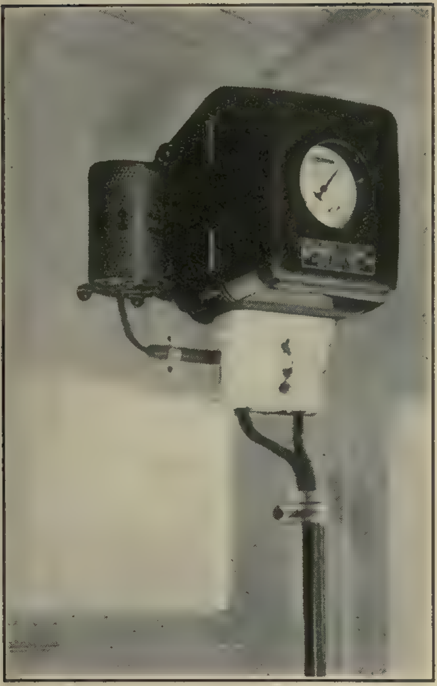
Pioneers in Steel Trim for Passenger Cars, including interior finish, steel doors, etc.

HK WALKOVER COPYRIGHTED

Hale and Kilburn Co.

Philadelphia New York Chicago
Washington Atlanta San Francisco

HK WALKOVER COPYRIGHTED



South Covington & Cincinnati Street Railway Co. Installs

Economy Meters

after comparative tests

The November issue of the United News—a monthly magazine for employes of the above company—prints an interesting article on the subject of power saving.

This article gives convincing figures showing the necessity of saving energy to offset the rapidly rising costs of fuel, etc.

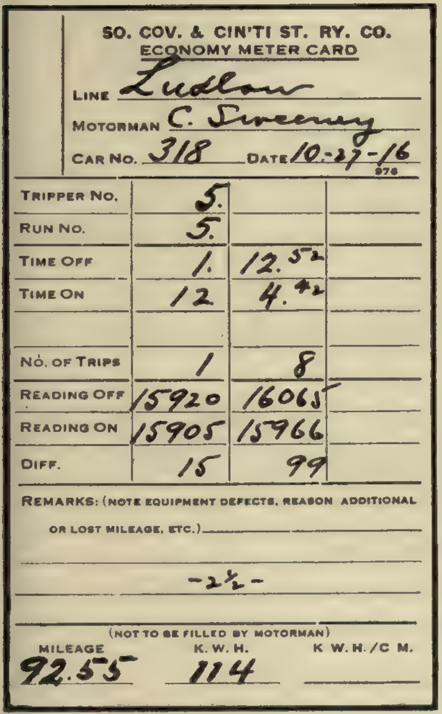
It was found that a 10 per cent saving in power on the Green Line cars would mean an actual cash saving of $1,085 per month. Furthermore this saving in power would mean a reduction in plant capitalization of $8,880.

Comparative tests were made of devices which are intended to enable the motorman to select that method of car operation which will move the car over the distance safely, on schedule time and with the least amount of power.

These tests resulted in the adoption of the Economy Meter as the most satisfactory device for obtaining the desired results. The complete installation calls for 110 meters.

The first lot of 25 meters were installed on the Bellevue-Dayton, Ft. Thomas, Ft. Mitchell and Ludlow lines. In two months' time the K.W.H. per car mile on these lines was reduced from 1.636 to 1.457 or approximately 11 per cent.

Let us furnish full information on other installations showing that Economy Meters will pay for themselves in a few months.



SO. COV. & CIN'TI ST. RY. CO.
ECONOMY METER CARD

LINE Ludlow
MOTORMAN C. Sweeney
CAR NO. 318 DATE 10-27-16
976

TRIPPER NO.	5.		
RUN NO.	5.		
TIME OFF	1.	$12.^{52}$	
TIME ON	12	$4.^{42}$	
NO. OF TRIPS	1	8	
READING OFF	15920	16065	
READING ON	15905	15966	
DIFF.	15	99	

REMARKS: (NOTE EQUIPMENT DEFECTS, REASON ADDITIONAL OR LOST MILEAGE, ETC.)

-2½-

(NOT TO BE FILLED BY MOTORMAN)

MILEAGE	K. W. H.	K. W. H. / C M.
92.55	114	

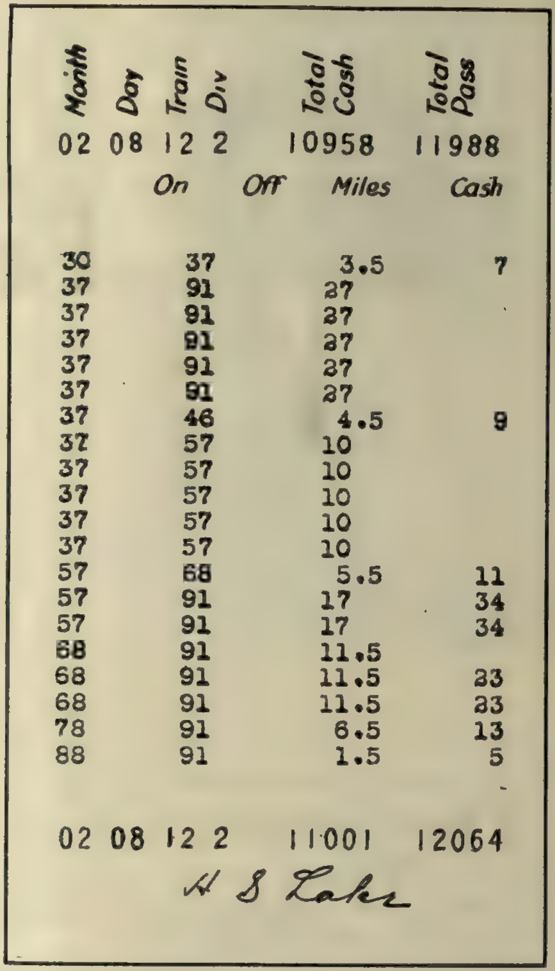
ECONOMY
SANGAMO
BUILT LIKE A WATCH
SANGAMO
METERS

Sangamo Electric Company
Springfield, Illinois

Specialists in Meters for Every Electrical Need

This is the Traffic Record

secured on the 45-mile Crawfordsville division of the Terre Haute, Indianapolis & Eastern Railway with the Bonham Traffic Recorder.



Month	Day	Train	Div	Total Cash	Total Pass
02	08	12	2	10958	11988

On	Off	Miles	Cash
30	37	3.5	7
37	91	27	
37	91	27	
37	91	27	
37	91	27	
37	91	27	
37	46	4.5	9
37	57	10	
37	57	10	
37	57	10	
37	57	10	
37	57	10	
57	68	5.5	11
57	91	17	34
57	91	17	34
68	91	11.5	
68	91	11.5	23
68	91	11.5	23
78	91	6.5	13
88	91	1.5	5

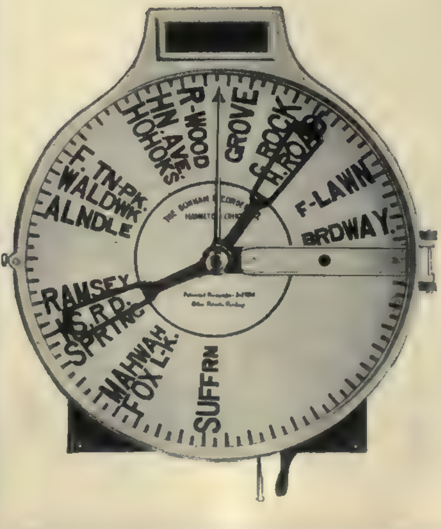
02 08 12 2 11001 12064

H S Lake

Observe that this record gives the fares paid, the total number of passengers and **the mileage traveled by the passengers** as indicated by the numbers of the stations.

Aren't these data invaluable to you? Your traffic man will welcome such information and will capitalize on it and your Auditor will find it of great importance to his department.

Because the 12 equipments on the Crawfordsville division made good that company has placed orders for equipping the cars of another division.



Bonham Traffic Recorders
will make good
for you, too

The Bonham Recorder Co.
Hamilton, Ohio

The Power Taken Out of a Car at the Brake Shoes Is the True Measure of WASTED Energy

It is of little value to measure the amount of power used to propel a car over a given run in a given time if the energy used is actually necessary to the service.

It is of extreme value to know how much energy is being used that is **not** necessary to the service rendered.

The Arthur Power-Saving Recorder provides that information

By an extremely simple arrangement of a clock mechanism connected with the air brake system two dials are operated which record

1.—The amount of time in minutes during a run for which the motorman uses the brake. And

2.—The number of times the motorman applies the air in order to stop or slow down.

It is obvious that if for the same run in the same time and under the same conditions one motorman applies his brakes more frequently and for a longer aggregate time than another man making the same run, then the first man has used more power than the second man, because he has taken more power out of the car **and he could not have taken more out unless he first put more in.**

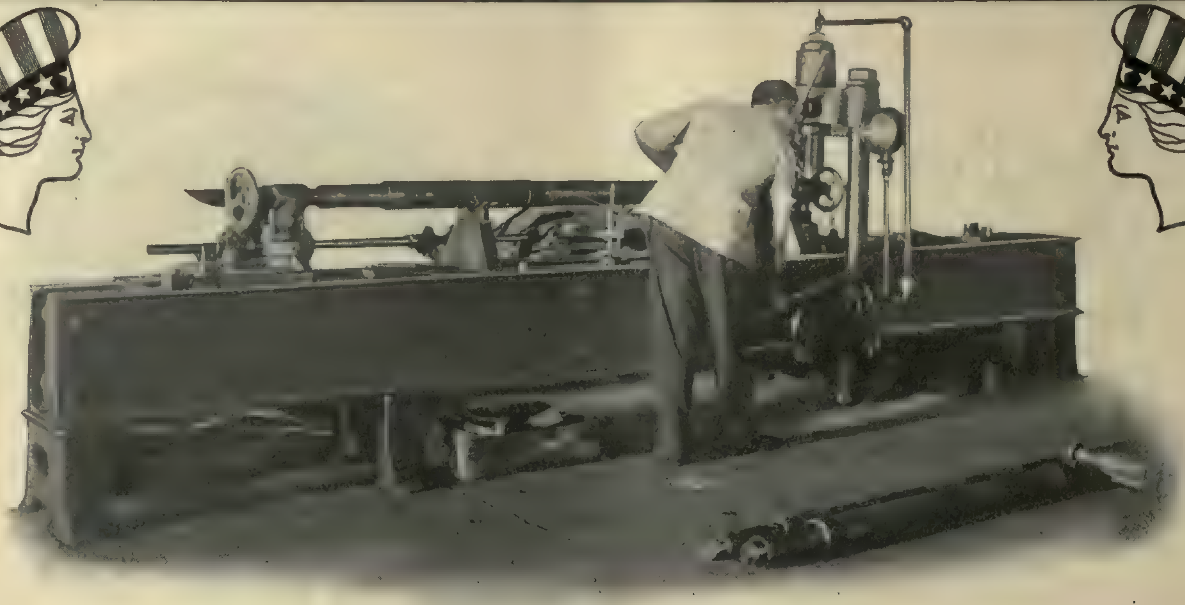
Simple, isn't it? **It encourages coasting, eliminates unnecessary stops and slow-downs, and increases safety.** Is absolutely effective in educating motormen to save power, which, of course, also saves wear on brake shoes and wheels.

Ask us to tell you the whole story of the new Recorder.

"Power wasted at the brake shoes is the true measure of the motormen's relative efficiency."

If interested in power-saving, investigate the merits of this new Recorder. Its simplicity and consequent low cost will appeal to you.

The Arthur Power-Saving Recorder Co.
New Haven, Conn.



Columbia Axle Straightener in the Shop of the Third Ave. Railway System, New York

The Columbia Axle Straightener Is Giving Good Service Here

In the shops of the Third Avenue Railway System, New York, just as it is in many other electric railway shops in the United States and elsewhere.

You ought to know all about the Columbia axle-straightener and then you'll order one sure. Here are the main facts:

Will straighten axles and shafts up to 6″ diameter.

The center heads remain in the same position during the entire straightening process.

An inside spring in the center heads takes up the pressure at the ends of the shaft, avoiding the removal of the center points from the axle centers when straightening.

Operation is by means of hydraulic pressure.

And the following Columbia specialties will also satisfy you:

TOOLS

- Armature and axle straighteners
- Armature shaft straighteners
- Armature buggies and stands
- Babbitting molds
- Banding and heading machines
- Car hoists
- Car replacers
- Coil taping machines for armature leads
- Coil winding machines
- Pinion pullers
- Pit jacks
- Signal or target switches
- Tension stands

CAR EQUIPMENT

- Armature and axle bearings
- Armature and field coils
- Bearings (axle and armature)
- Brush-holders and brush-holder springs
- Brake, door and other handles
- Brake forgings, riggings, etc.
- Car trimmings
- Commutators
- Controller handles
- Forgings of all kinds
- Gear cases (steel or mall. iron)
- Grid resistors
- Third-rail shoe-beams and accessories
- Trolley poles (steel) and wheels

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St., Brooklyn, N. Y.

W. R. Kerschner Co., Inc., N. Y. Holden & White, Inc., Chicago F. F. Bodler, San Francisco

WARNING

We hereby announce that we have secured exclusive manufacturing and selling rights under the following United States Letters Patent issued to Edson O. Sessions: No. 1,213,960 dated January 30, 1917; No. 1,221,611 dated April 3, 1917 and No. 1,228,142 dated May 29, 1917, for

LOCKING SWITCHES
and
HIGH TENSION INSULATOR SUPPORTS

These patents afford us exclusive manufacturing rights on the constructions claimed therein and equivalents thereof. Any one, either person, firm, or corporation, who manufactures, sells or uses, without our permission and consent, the said constructions or their equivalents, or any of them, is an infringer upon our rights.

INFRINGERS WILL BE PROSECUTED

General Devices & Fittings Co.

817 W. Washington Blvd.
CHICAGO, ILL. **U. S. A.**

General Devices & Fittings Co. are manufacturers of disconnect type switches, with and without locks, for any amperage or voltage or number of bars, either front or back connected or in combinations.

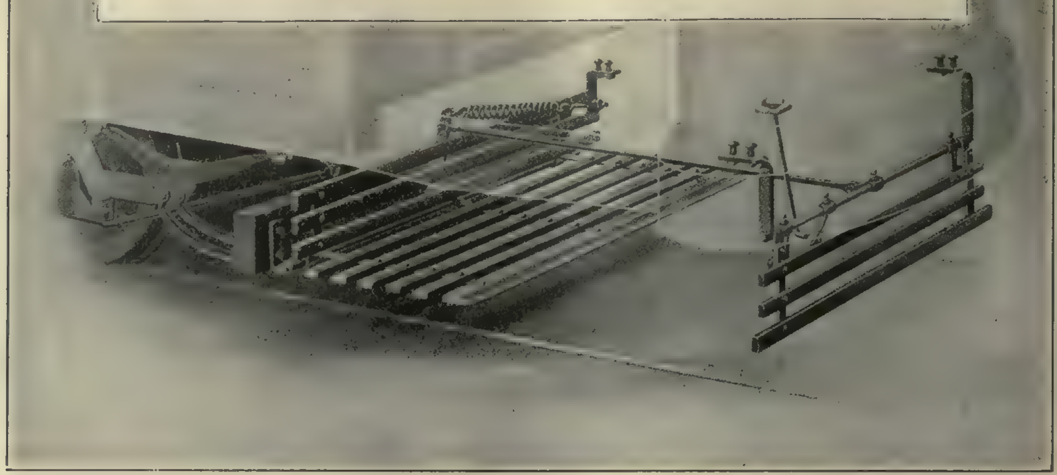
Also single, double and combination bus supports of every description for any service, any voltage, any type or kind of conductor, and for mounting on flat surface, single or double pipe frame, or combinations of these.

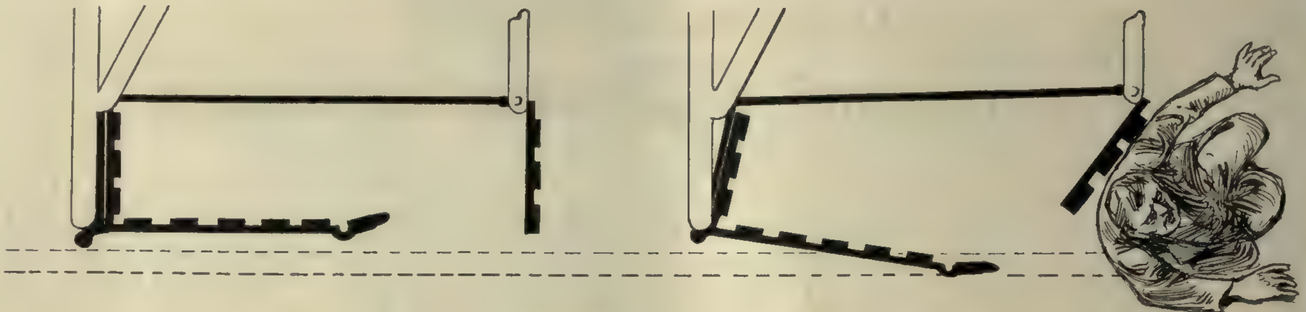
We carry the largest and most complete stock of corrugated porcelain in the country, and also stock our own design of floor and wall bushings for tubular or rectangular conductors, and for all voltages.

We guarantee that our switches have the lowest attainable millivolt drop across same and our porcelain the lowest energy loss, consistent with great mechanical strength.

Canadian Agents, A. H. Winter Joyner, Ltd., Toronto and Montreal

AUTOMATIC SAFETY





Quicker Than Thought

Ready for automatic instantaneous action every second of the day's working.

That is the duty of an efficient life guard.

H-B Life Guards

and Providence Fenders

do all these things. The sole reason for their manufacture is to save life and money.

They have been repeatedly endorsed by Public Safety Committees, but their reputation has been made by actual street service, not special demonstrations.

Blue prints and full particulars gladly sent on request.

The Consolidated Car Fender Co.
Providence, R. I.

General Sales Agent
Wendell & MacDuffie Co.
61 Broadway, N. Y.

ONE-WEAR

NO TURNING

DAVIS STEEL WHEEL

The hard, tough manganese steel flange and tread is the secret of its big mileage.

American Steel Foundries
1105 McCormick Building
CHICAGO

OILLESS TROLLEY WHEEL AND NON-ARCING HARP

Using V-K Wheels and Harps means a saving all along the line.

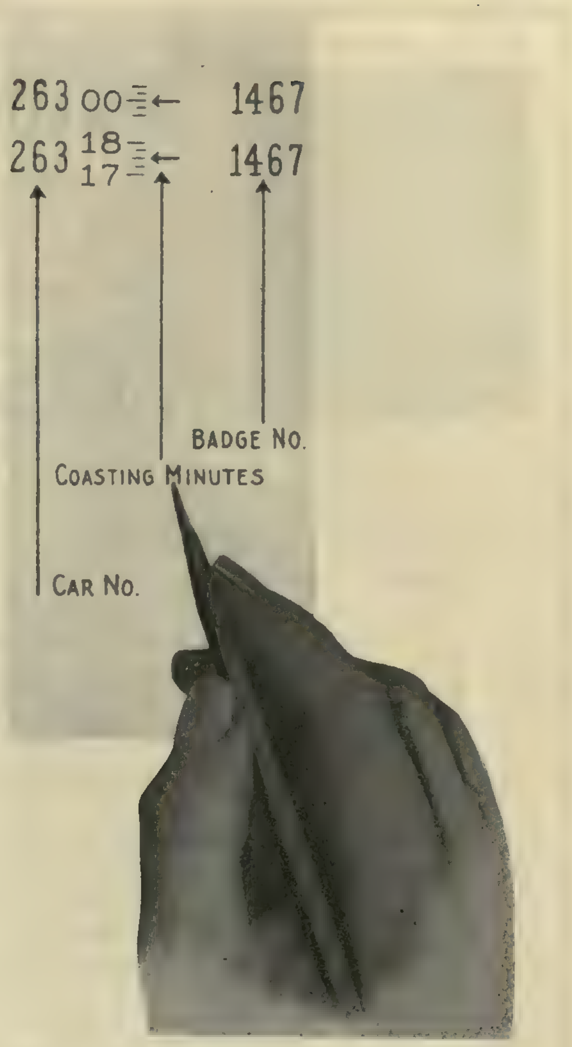
Time, labor and lubricant are saved because the patented V-K bronze gauze and graphite bushing supplies ample lubrication during the whole life of the wheel. The extra conductivity gained through there being no oil or grease around the bearing saves current. Car roofs are saved from wear and tear of shopmen's feet in the inspection and oiling of old type wheels. The V-K Harp saves waste and lengthens life of wheels and pins.

These are exclusive V-K features—proved efficient in thousands of installations.

Send for illustrated catalog.

More-Jones Brass & Metal Co., St. Louis, U.S.A.

The Rico Coasting Recorder



Shows the Slack in the Line

DIRECTLY

The phrase "slack in the line" is simply another expression for COASTING.

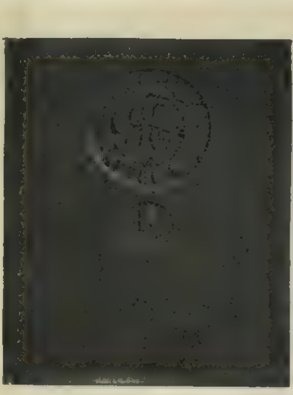
Some of this slack is necessary to maintain a schedule in practical operation; and another portion of this slack is necessary to insure the minimum combined costs of power and platform expense for given conditions.

With the Rico Coasting Recorder, and the Rico Coasting Recorder only, NO CALCULATIONS OF ANY KIND are required to determine whether any existing schedule has an excessive amount of slack, and whether the said schedule is maintained to give the efficient amount of slack.

This is true because the Rico Coasting Recorder *prints directly*, and *within the comprehension of the motorman*, the very information —(namely, the amount of coasting in *minutes*) required to insure the most economical and most satisfactory service.

Time is the Essence of Railroading

RAILWAY IMPROVEMENT CO. RICO 61 BROADWAY, NEW YORK



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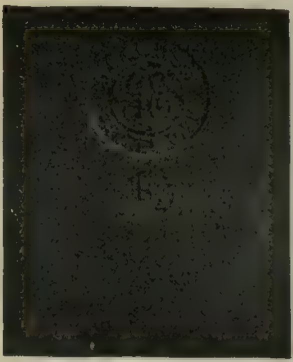

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>
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>
> G-E brushes in test with other makes are still running after five months with very little wear. Other makes have broken or worn out.

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"CO-OPERATING" WITH THE COMMISSION

When Mayor Mitchel instructed the corporation counsel of New York City "strenuously and constantly to oppose the requests of the street railways unless and until they show that the need for increased rates is imperative and permanent," we did not suppose that the city would object to a fair hearing on the companies' petitions. Yet that is exactly the attitude that has been taken by the city counsel at the opening hearings for the Third Avenue Railway this week. Counsel for the company has asked for nothing except simple justice and has been trying to present facts in a frank and open manner, but the city lawyers have endeavored so to obstruct proceedings with technical objections that the commission has seen fit to remind them that before it if not before the courts evidence is admitted upon the basis of common sense. The point of the whole matter is that the city has approached the case from an *ex parte* point of view. In over-emphasizing its solicitude that no transfer charge be "imposed" upon passengers, the city has forgotten that a rate fixed by the commission as fair and reasonable cannot be an imposition upon the car riders. The commission, we believe, will be just. If New York City objects to justice being done, it is not right for it in using obstructive tactics to say that it is co-operating with the commission. If the city wants to co-operate, it must appreciate the impartial position which the commission occupies in the proceedings.

THE PRESENT STATUS OF THE PAVING TAX

Among the avenues of possible financial relief which are open before electric railways one of the most promising is that leading to amelioration of the paving tax burden. This has been referred to frequently of late in connection with the agitation for higher fares, but much of the reference has been of a general nature. In order that the present status of the matter might be clearly understood the ELECTRIC RAILWAY JOURNAL commissioned R. C. Cram, of the way and structure department of the Brooklyn Rapid Transit Company, to make a study of the facts on a typical property and of the attitude of judicial and regulative bodies toward the facts in general. The result is the article published in this issue. It furnishes a convincing demonstration of the heritage which has come down from horse-car days and of the power which municipalities have in many cases to compel the railways to do paving work not contemplated when the franchises were originally bargained for. At the same time the evidence cited by the author of the article indicates a growing desire on the part of the commissions and courts to be reasonable in demanding the rights technically possessed by the public under the franchises. Each reasonable ruling by a public service commission or a court of justice will tend toward further relief, for precedent is powerful in matters of this kind. It was precedent that loaded the paving burden on the electric railways, the precedent set in horse-car days, and precedent after precedent will mark the progress toward better conditions.

EMPLOYMENT OF WOMEN IS INEVITABLE

We quoted last week words of urgent advice from abroad to the electric railway companies of this country to prepare for the depletion of the supply of men in this country, owing to war conditions. All of the belligerents have found that modern war requires a reduction in the number of men unnecessarily employed in home industries and the substitution, where possible, of women where the work still has to go on. In the opinion of leading electric railway men abroad, this change, with the maintenance of efficient railway service, is the most valuable contribution which our electric railway companies can make in the fight for democracy in which we are engaged. Such a plan does not mean a loss of employment to the present employees. Any change of this kind would have to be made gradually to fit the new employees to their tasks, if women conductors are employed on a large scale. Hence, on most roads, the cessation of the engagement of new men would be sufficient to secure the result sought. But even if a few men should be displaced, there is no danger of unemployment in this country for a long time to come. Any person who loses a job will find two others awaiting him, and he will not have to look for them longer than twenty-four hours. As Secretary of War Baker said recently, the exigencies of the war will require readjustment in a great many trades and industries in this country, but this need cause no apprehension because there is important work for all to do. We hardly believe that there will be any serious difficulty with the men on either union or non-union roads if our traction properties should go on a war basis in the way suggested. As matters stand now they cannot get the labor they require. Their need and that of the nation is great, and the labor leaders have already shown their patriotism in many ways. Moreover, in Great Britain, where unions are strong, the use of women in all sorts of labor where formerly men only were employed is extensive. Nevertheless, we urge all companies to set the facts frankly before both their men and the public, and the present is none too early to begin.

ROBBING PETER TO PAY PAUL In these columns we have set forth the great possibilities for additional earnings through the solicitation of package and general freight traffic and have urged this course as a means of expanding business beyond the possibilities of the passenger traffic. However, this should not be done to the neglect of the passenger traffic. The latter represents the bread and butter of the electric interurban, so to speak, while the freight traffic might be regarded as a sort of bonus. Hence, any development of freight traffic which acts materially to discourage passengers is not good business. A case has come to our attention recently of a road which apparently does not realize this fact. About two years ago it started to carry package freight on the front ends of its passenger cars. The business was profitable and rapidly increased to a volume beyond the capacity of the front vestibules. Instead of providing additional equipment, the company moved the front bulkheads back into the cars, thus decreasing the passenger space to provide freight space. As no additional cars were put in service, the effect on the passengers has not been good because whenever the cars are crowded the standing passengers feel that they are being deprived of seats because of the freight carried. A better plan would have been to operate separate package cars, if the rules of the company did not permit the passengers to overflow into the baggage compartment when there were no seats in the body of the car, or else to increase the number of cars and explain to the public that owing to the use of combination cars a more frequent service was possible.

COURTESY AND SERVICE

Car men who are slow to realize their duty to serve the public courteously are not likely to meet with favor in the public eye. This was well illustrated in a recent court case in which a patron was being tried for pulling the pole from the wire. He admitted the charge, but entered the defense that the car crew had unjustly refused to open the door for him. The magistrate, seeing the scornful expression on the conductor's face during this testimony, made this statement: "I know the kind. A similar thing happened to me. I stood speechless while the car sped away, and all I got was a broad smile from the conductor."

Although the defendant in this case was held under bail to keep the peace, it is quite evident that the experience of the judge must have placed a severe strain upon his judgment. There are too many electric railway employees like the one who aroused the judge's ire. It is true that a car man almost daily meets circumstances which try his patience with the traveling public, but the employee who is a real asset to his company is the one who can rise superior to the occasion, however disagreeable, and do what he is supposed to do—sell rides.

A great deal has been said lately in electric railway circles about selling service. The idea is as old as this industry, and some of the electric railways have practiced it from their beginning. Too many have not. That is why there is an air of newness about it to some companies. In the steam railway industry—good examples might also be pointed out in the electric railway field—perhaps the most conspicuous example of courtesy or selling service applied daily is the Pennsylvania Railroad. "Pennsylvania Railroad" has come to mean courtesy and service.

Lack of courtesy has often damned an otherwise admirable street railway service. The very monopolistic aspect of such service tends to accentuate lack of courtesy on the part of employees, for as a usual thing there is no escape from it. The feeling of resentment that is engendered may not manifest itself openly, but it is no less potent on that account. Indeed, it is much more disastrous in its far-reaching and lasting effects than an abuse which is flagrant and about which specific complaint can be made.

A great deal of attention is given to the physical and the moral fitness of men applying for positions as car men in electric railway work. The possession of selling ability, however, ought also be required in prospective employees. An inquiry about this at the beginning would make unnecessary much of the corrective work that a number of companies have felt it incumbent upon them to carry out among old men who are admirably fitted in some ways for their duties but who lack the pleasing manner that fills one with a sense of satisfaction in having dealt with them.

SETTLE THE STATUS OF THE MANUFACTURER

As there will be no exhibit this year, an excellent opportunity is afforded for determining the relation of the manufacturers to the conduct of future exhibits—in fact, for reviewing the whole subject of the status of the manufacturers in the American Electric Railway Association. It is only fair to say that the convention arrangement of last year by which the conduct of the exhibit was taken out of the hands of the manufacturers and carried on by the railway association was not entirely satisfactory to the manufacturers as a body, but there was not time to work out any different plan. There is this opportunity now, and it should be utilized to effect a permanent plan of organization.

Two fundamental considerations should be recognized in any arrangement made for the future. One of these is that the association should represent in its membership the entire industry because its primary purpose is to improve the conditions in the industry, and this will be for the benefit of companies and manufacturers alike. Hence, the plan adopted at Chicago of full and equal membership for both manufacturers and railway companies is correct and should be retained. This arrangement will give the association the larger income which it needs, especially at the present time.

The second fundamental consideration in a successful association is that the work within the organization should be divided along natural lines. It must be recognized frankly that while the ultimate aims of both classes of members are the same, that is, to improve the status of the industry, their immediate aims are radically different. The function of the railways is to sell transportation to the public at a reasonable profit; that of the manufacturers is to sell equipment to the railways, also at a reasonable profit. Hence, within the association, the part of the work which relates to transportation questions and the relations of the railway with the public should be undertaken primarily by railway members, while that relating to the sale of equipment should devolve upon the manufacturing members.

This division, if accepted, is controlling in determining the question who will conduct the exhibits. This work is no more a proper function of the railway members than is the solicitation from the manufacturers of advertising in *Aera*. The manufacturers should be the best judges of the way in which their equipment should be offered to the railway members. Past differences of opinion between the railway and manufacturing members have arisen largely because this fact has not been recognized. If the manufacturers take over the conduct of the exhibit, as we believe should be done, the work could well be carried out under the general approval of the association executive committee, on which there should be adequate representation from both the manufacturing and railway sides of the industry.

WHAT IS AHEAD OF THE ELECTRIC RAILWAY INDUSTRY?

The momentum of the movement to make the charges for electric railway service accord more accurately with the cost of giving the service grows apace. Hearings have been held this week before the Public Service Commission for the First District of New York concerning the application to make a charge of 2 cents for transfers. It is expected that the application for 6-cent fare for most of the up-State companies in New York will be filed either at the end of this week or early next week. The movement to secure a similar advance, is, we understand, being considered in Massachusetts, and the same is probably the case in several other states. The reports which are constantly coming in of increasing costs of operation show that economic law is forcing this issue to a crisis, quite as much as the activities of the companies themselves.

The electric railway industry is undoubtedly at the parting of the ways. The old 5-cent fare is doomed. What may come in its place we do not know. Probably a general 6-cent fare is apt to be quite widely adopted. Some modification of the zone system may be worked out where it can be made practicable. Charges for transfers will meet the situation elsewhere. But the conclusion is incontestable that the 5-cent fare as a national institution, regarded as inviolate as the constitution of the United States, cannot much longer hold its sway over the public mind.

A good deal of public opposition is manifest to the changed conditions. Railway rates may be raised, but comparatively few people realize that they are paying railway rates; the actual number of shippers is relatively smaller. Taxes may be constantly going up, yet only a few people realize that they are paying taxes. But everybody pays car fare. A rise of 1 cent in the unit of payment seems something abnormal. There is in fact nothing abnormal about it; it is simply the disturbance of a habit of mind.

The public must be made to see that electric railway service is a commodity. It is a commodity which should be provided for the public at the lowest possible cost. But the elements which enter into that cost cannot be disregarded. If the public can be served most cheaply through municipal ownership, it is in the public interest that there should be municipal ownership. But if it is, as we believe it to be, a fact that the most economical service can be provided through private operation, it is certainly in the interests of the public to promote efficient private operation. That private operation is subject to a very definite arithmetical equation is set forth in the article on another page showing how the costs of all operation are going up.

Mayor Mitchel of New York has suggested that electric railway companies ought not to add to the other burdens imposed upon the public by the war by adding to the charges for their service. He has intimated that the electric railway companies in New York City are seeking to be exempt from bearing their share of the burdens incident to the war. It is astonishing that such an argument should be made by one so intelligent as Mayor Mitchel. Manufacturing companies of all kinds, merchants, working men, the government itself, have increased their charges for performing the service they render. It is all considered to be regrettable but inevitable. But if companies subject to public utility laws seek to increase their prices to take care of the increasing costs, it is intimated that they are seeking to avoid bearing their share of the burdens of the war!

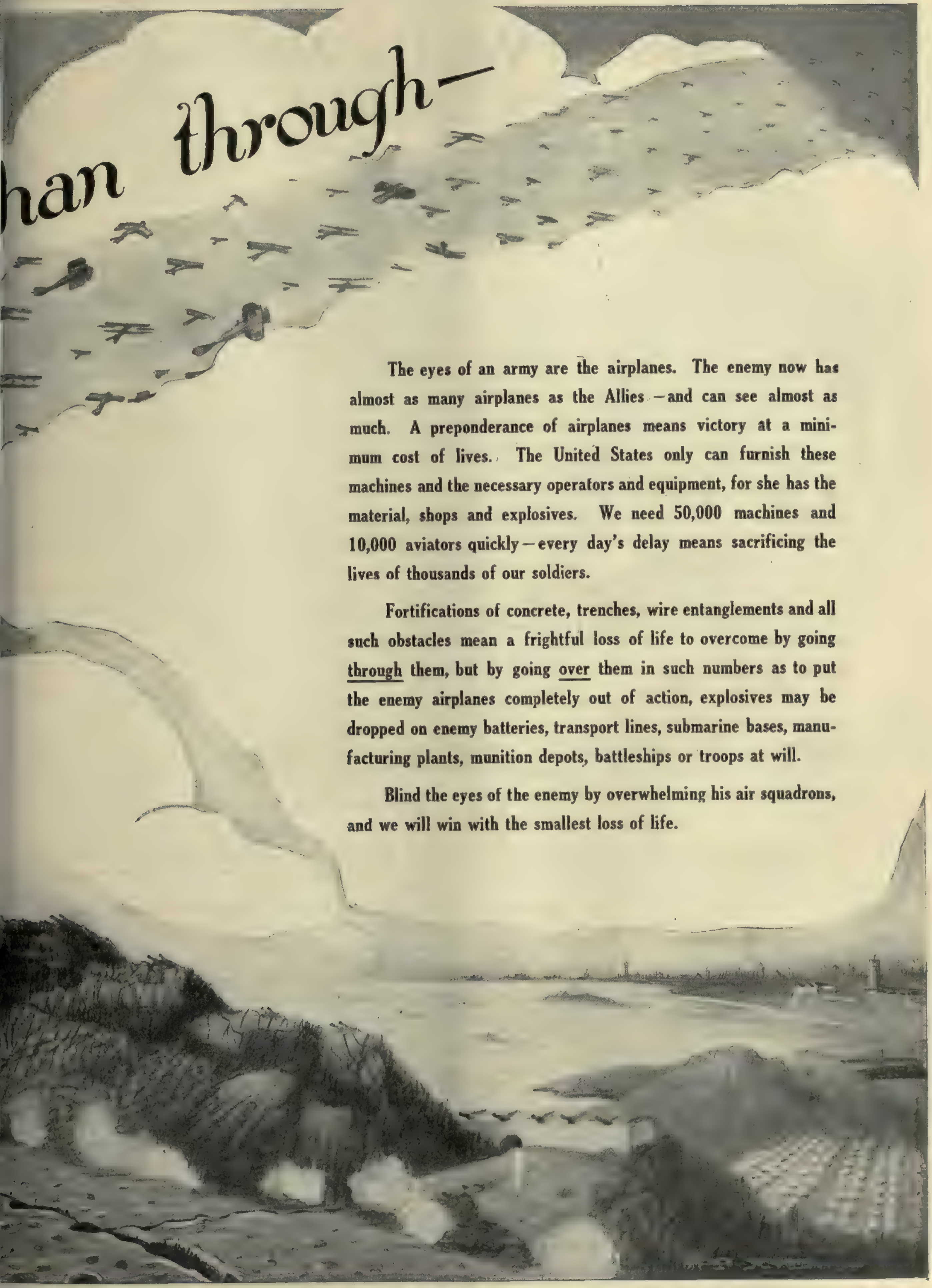
The only reason that any such claim could be put forth at all is that these companies must obtain the sanction of public service commissions to increase their prices. That focuses upon public authority the necessity for making a decision to allow such increases to be made. Any such decision is bound to be unpopular, no matter how justified it may be. Public officers are selected by votes—by popular votes. And on the eve of a campaign the temptation to make political capital seems too great to resist.

But we hold firm to the faith that the people are perfectly fair and that politicians who appeal for popular applause by imposing unjust burdens upon public utility companies are but sowing the wind against the inevitable whirlwind of public disfavor. The people sooner or later will realize the truth, and the public officer who shows courage and follows his honest convictions, rather than makes a specious appeal to the fleeting popularity of the multitude, will in the long run secure and hold public confidence.

We are therefore among those who believe that out of the vast mass of conflicting currents which are now sweeping over our national life, there will ultimately emerge a tidal wave of common sense and sanity of view which will once more restore to our people the sound foundations of economic law upon which alone a permanent edifice of national prosperity can be built. And upon that foundation we expect to see erected a constructive treatment of the electric railway problem.

As the Eagle flies—
It is easier to go ove

These two pages were prepared by the art department of the McGraw-Hill Publishing Compan


han through—

The eyes of an army are the airplanes. The enemy now has almost as many airplanes as the Allies—and can see almost as much. A preponderance of airplanes means victory at a minimum cost of lives. The United States only can furnish these machines and the necessary operators and equipment, for she has the material, shops and explosives. We need 50,000 machines and 10,000 aviators quickly—every day's delay means sacrificing the lives of thousands of our soldiers.

Fortifications of concrete, trenches, wire entanglements and all such obstacles mean a frightful loss of life to overcome by going through them, but by going over them in such numbers as to put the enemy airplanes completely out of action, explosives may be dropped on enemy batteries, transport lines, submarine bases, manufacturing plants, munition depots, battleships or troops at will.

Blind the eyes of the enemy by overwhelming his air squadrons, and we will win with the smallest loss of life.

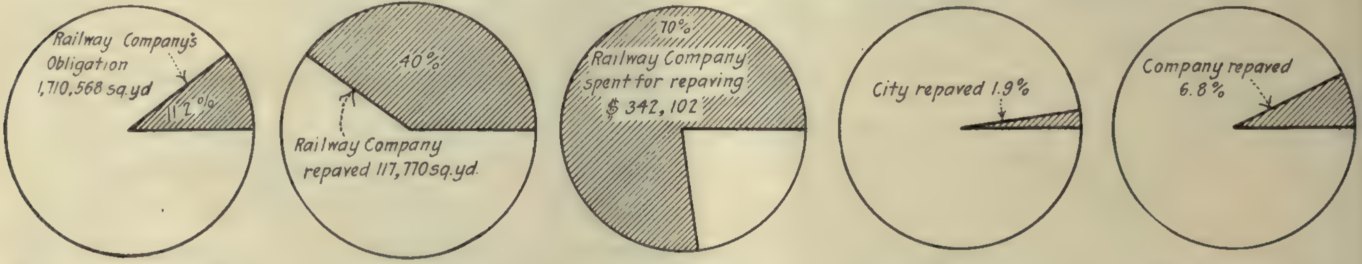
to illustrate the editorial in our last issue on "Air Supremacy Cheap at Half-a-Billion."

What Shall We Do With the Paving Burden?

The Author Sums Up the Repaving Situation and Summons Authorities to Prove the Injustice of the Historic but Outgrown Tax—He Cites Some Convincing Data from Brooklyn

By R. C. CRAM
Assistant Engineer Way and Structure Department, Brooklyn Rapid Transit System

THE object of this article is threefold: (1) To call attention to the ever-increasing importance of the pavement as an item now considered a part of track maintenance and construction costs. (2) To develop interest in the means for securing a more equitable adjustment of the track pavement burden between the municipalities and the street railways. (3) To suggest revision of the classification of accounts so that the track pavement maintenance cost may be more properly considered as a deduction from income under the head of "Taxes" instead of a track maintenance charge under "Operating Expenses." It is believed that the subject is of particular moment at this time, when every effort is being made to "increase the fare," because the contributions of the railways for pavement (even though required by franchises) are rapidly growing and are not generally considered, either by the public or by the railways, as taxes.



Relative paving obligation, complete circle represents 15,332,105 sq. yd.

Relative repaving work, complete circle represents 297,379 sq. yd.

Relative repaving expense, complete circle represents $446,287.

City repaving in per cent of obligation represented by full circle as 100 per cent.

Company repaving in per cent of obligation represented by full circle as 100 per cent.

DIAGRAMS SHOWING RELATIVE QUANTITY AND EXPENSE OF PAVING IN BROOKLYN, N. Y., BY THE RAILWAY COMPANY AND THE MUNICIPALITY

It is necessary to go back to the historical horse-car days to find the reason for the imposition of the track pavement burden upon the street railways. History tells us that when horses furnished the motive power the track pavement was often worn excessively by the constant travel of horses in regular paths between and adjacent to the rails. There was considerable justice in requiring the railways to maintain the pavements under those conditions, but with the advent of motor-operated cars the conditions were immediately changed and the contributory wear of pavement was removed. Nevertheless most of the early operators of electric street railways failed to realize this important fact and continued to seek and accept franchises with pavement burdens attached thereto.

It is also a matter of record that during the horse-car and early electrification periods the track pavements were usually composed of cobble or macadam, costing from 50 cents to 70 cents per square yard. In contrast we now have track pavements of granite, wood or brick costing $2.80 to $3.50 per square yard, representing an increase of from 500 to 700 per cent. In other words, the present situation is one wherein we now have a vastly increased pavement cost with no contributory wear in contrast with the former condition of a considerable contributory wear with a comparatively small pavement cost.

DATA ON THE EXTENT OF THE BURDEN

In order to determine the correctness of the impression that the railway company's share in maintenance of city pavements is larger than is ordinarily supposed, the writer recently had a study made of the widths between curbs on streets occupied by tracks in Brooklyn. It was found that there were tracks in some 200 different streets, and computations for 100 streets indicated that the average width between curbs is 39½ ft., and that the pavement areas maintained by the railway and the city amount to 48 per cent and 52 per cent respectively.

In a number of streets in the older sections of the city the railway area reached 61 per cent. The railway area was computed on the standard track centers of 9 ft., 8½ in., and the statutory obligation to pave "between the rails of the tracks and 2 ft. outside thereof." It is particularly interesting to note that, while the railway maintains areas substantially equal to city areas in these streets, traffic counts as reported by the way committee on way matters in the 1915 *Proceedings* of the American Electric Railway Engineering Association show that "from 50 per cent to 90 per cent of the vehicular traffic comes upon the railway pavement area in many streets."

The argument might be advanced that this fact would indicate excessive wear of pavement due to tracks in streets and such wear should be a burden upon the street railways. It is observed, however, that in any streets of similar widths the simple factor of the parking of automobiles forces the normal stream of traffic to the center of the street and that this occurs on streets without tracks. The tracks themselves, when consisting of tram or groove girder rails, take excessive wear from the street pavement; in fact, in Chicago it has been found that rails in streets upon which no cars have ever run are wearing out just as fast as though there was car traffic upon them, and this wear is solely due to wagon traffic. It is a fair question to ask what would happen to the pavement if it alone had to withstand wear of this character.

A comparison of the Brooklyn Rapid Transit Company's total paving obligation with that of the city discloses a number of rather surprising features, as indicated in the tables reproduced herewith, which were compiled from the records of the Bureau of Highways of Brooklyn. The figures and percentages obtained are naturally subject to various interpretations and the following explanation may not be out of place.

TABLE NO. 1—COMPARISON OF TOTAL PAVED AREAS

Year	City, Sq. Yd.	Railway Co., Sq. Yd.	Per Cent of City Area
1913	13,701,592	1,646,434	12.0
1914	14,341,273	1,699,098	11.8
1915	15,332,105	1,710,568	11.2

The tables do not include any expense or yardage for regular or "ordinary" miscellaneous paving repairs scattered about the city. This is indicated by the word "repaved," under which all areas repaved in toto, either by the city or the railway, because of wear and track conditions, are included. It must be borne in mind that the railway company's repaved area cannot bear the same relation to its total obligation area as does the city's because it is almost impossible to determine how much of the railway area required repaving because of defects and wear alone, while much of the city's area is repaved (at least on streets having no tracks) because of defects and wear only. However, a certain proportion of city repavement on track streets is at least partly required by adjustments in cross-section due to revised track grades given by the city. Even so, the railway company's expenditure is much higher in cost per square yard than the city's expenditure, due largely to the use in the main of granite on concrete by the railway and of sheet asphalt by the city. The latter can thus secure a greater repavement area for an expense equal to that of the railway. Attention is directed to the tables and graphs which indicate more clearly the relations between the railroad pavements and the city pavements and the following explanations thereof should be of interest.

SOME COMMENTS ON THE TABULATED DATA

Table No. 1 is a three-year comparison of the total paved areas installed by the city and the railway company respectively to the end of the calendar year 1915. It will be noted that the railway company's obligation area ranges from 11.2 per cent to 12 per cent of the city's area.

Table No. 2 compares the areas repaved annually by the city and the railway company and indicates that the railway repaves areas equivalent to from 25 per cent to 40 per cent of the areas which the city repaves.

TABLE NO. 2—COMPARISON OF TOTAL REPAVED AREAS

Year	City, Sq. Yd.	Railway Co., Sq. Yd.	Per Cent of City Area
1913	661,290	165,058	25
1914	414,357	159,522	39
1915	297,379	117,770	40
	1,373,026	442,350	32 per cent for 3 yrs.

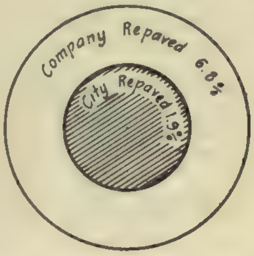
Table No. 3 compares the expenditures of the city and the railway company at Bureau of Highway rates, and brings out the point that the railway's expenditures range from 33 per cent to 77 per cent of the city's expenditure, although the railway's obligation area is only 11.2 per cent to 12 per cent of the city's. This table emphasizes the point that the railway pavements cost more in proportion than the city's, due to the general use of more costly pavements by the railway company. It is only fair to state in connection with the figures for 1915, that the highway bureau was hampered by lack of funds for pavement work until very late in the year, which greatly reduced the amount of work which could be accomplished that year.

TABLE NO. 3—COMPARISON OF TOTAL REPAVEMENT EXPENSE

Year	City	Railway Co.	Per Cent of City Expense
1913	$1,505,515	$498,220	33
1914	1,046,828	495,655	47
1915	446,287	344,102	77

Table No. 4 compares the relations of the repaved areas to the total paved areas maintained by the city and the railway and shows the striking fact that the railway repaves very much more of its area annually than does the city, in proportion to the respective obligations, even though the railway's expense is also greater for equivalent areas.

The magnitude of the railway's paving obligation is more fully realized when expressed in terms other than yardage alone. The Brooklyn Rapid Transit System maintains approximately 2,640,000 sq. yd. of pavement in the Boroughs of Brooklyn and Queens, which at an average cost of $2.50 per square yard would have a value of $6,600,000. Ultimately the above area, if all paved with granite on concrete, would have an estimated value of over $9,000,000. The foregoing yardage is equivalent to that required for a state highway 18 ft. wide and 250 miles long, or for a 30-ft. street 150 miles long—enough for a fair-sized city. It has been stated that the pavement investment in tracks in Chicago up to the end of 1914 represented an investment of $7,373,683. These figures represent original investments, but we have also to consider repavement charges. In the Borough of Brooklyn alone, the railway company expends from $350,000 to $500,000 annually for repavement, with an additional sum ranging from $50,000 to $70,000 yearly for miscellaneous pavement repairs.



CITY AND COMPANY REPAVING COMPARED

The Connecticut Company recently filed a brief with the Public Utilities Commission of Connecticut wherein the statement is made that the company has expended an average of $400,000 per year on pavements for the last three years. Furthermore it appears that from 30 per cent to 40 per cent of track maintenance charges are for pavement, while about 50 per cent of the new construction expense goes to the pavement account. Such figures, combined with the rapidly in-

TABLE NO. 4*—COMPARISON OF RELATION OF REPAVED AREAS TO TOTAL PAVED AREAS

	City			Railway Co.		
Year	Total Paved Area, Sq. Yd.	Repaved Area, Sq. Yd.	Per Cent of Total	Total Paved Area, Sq. Yd.	Repaved Area, Sq. Yd.	Per Cent of Total
1913	13,701,592	661,290	4.8	1,646,434	165,058	10.0
1914	14,341,273	414,357	2.9	1,699,098	159,522	9.3
1915	15,332,105	297,379	1.9	1,710,568	117,770	6.8

*From Table No. 4 it will be seen that the railway repaved from two to three and one-half times as much area, proportionately, as did the city, based on the relative obligations.

creasing costs of labor and materials, may well cause us to seek for relief.

PUBLIC OFFICIALS SHOW NEW INTEREST

There is a growing interest on the part of the municipal and state authorities generally in the broad subject of public dealings with public utility corporations. This interest appears more and more to take the form of a real study into the fairness of such dealings as having a direct and vital bearing on the public welfare. The creation of public utility commissions charged with the study of such affairs and the comparatively recent wave of franchise renewal discussions in municipalities in all parts of the country has given the representatives of the people and the public in general a clearer view of the subject. Suspicion is being replaced with confidence gained largely by the open discussions which have all tended to show the fundamental truths underlying public relations. The most important of these is the fact that wrongs inflicted in the name of the public upon corporations supplying vital public utilities always react directly or indirectly upon the people themselves.

"Daylight Ahead" Indicated by These Facts

The author cites various instances of a more reasonable view of the paving burden, such as a commutation in Philadelphia for a stated sum of the former paving obligation, the distinction drawn in the Cleveland ordinance between pavement maintenance (which the company is obliged to do) and repaving (which it is not), the recommendation of the Massachusetts commission in the Bay State case that the companies be required "to meet only the reasonable cost" of such work, and the decision of the Maryland Court of Appeals, upheld by the United States Supreme Court, that there is a difference between repairs and repaving.

One of the earliest indications of the new public viewpoint, which has a particular interest in this discussion of the pavement obligation, is found in the now famous Ordinance of Councils of the City of Philadelphia, dated July 1, 1907, which is an agreement between that city and the Philadelphia Rapid Transit Company in a radical readjustment of many conflicting franchise obligations relating to that company's paving burden. The fourth and sixth paragraphs of the preamble to that agreement recognize that "the terms, conditions, restrictions and liabilities which have been imposed upon these various companies (all of which shall be taken as included in the words 'subsidiary companies' wherever the same are hereinafter used) differ widely, and there is dispute and uncertainty with respect to the effect of many of the provisions thereof, and it is believed that it is to the interest of the public as well as of the parties hereto to supersede the former regulations, and to define and regulate the relations between the parties hereto so as to make them fixed, fair and uniform." Further that "a large sum of money is required to improve, complete and extend the present system of the company in order that it shall better serve the public; and for this purpose it is essential that the position of the company be clearly defined, and the securities of itself and its underlying properties unquestioned, and its right to make extensions in the future assured, in order that it may obtain credit to finance the increased transit facilities so necessary for the welfare of the public and the development of the city."

The said agreement provides, among other things, for the paving, repaving and repairing of railway pavement areas by the city and relieves the company of charges for pavement, snow removal, bridge licenses and other similar burdens and prohibits all further imposition of such burdens upon payment, by the railway, of definite sums of money, beginning with $500,000 and increasing by $50,000 for each term of ten years. The railway, however, must replace or repair pavement removed or damaged by its construction and repair work.

The tenth clause of the agreement proper construes these payments as in the nature of taxes in the following words: "To such extent, however, as taxes and assessments not upon such real estate or dividends may hereafter be imposed upon the company for the benefit of the city, the city shall credit upon the taxes that may thus be hereafter imposed all payments made hereunder as well also as the sums which shall be divided with and paid to the city out of earnings."

From this synopsis of the Philadelphia situation it will be seen that the city recognized certain advantages to be gained from the modernized paving policy in definition of the paving obligation which would tend to better the financial position of the company without harm to the city, and thus assist in the development of transit facilities so essential to the growth of any community. At the same time the city also recognized the fact that franchise pavement burdens must be considered as taxes.

The great importance of defining the amount of the paving tax for a term of years cannot be emphasized too strongly, regardless of the question as to whether or not the particular method above cited would suit the prevailing conditions throughout the country, because most companies to-day do not know nor can they even prophesy as to what sums they will have to pay for the annual pavement tax. It may be $50,000 this year and $250,000 the next, largely subject to orders of public officials, who often have arbitrary and unrestricted powers to require unwarranted expenditures under the broad terms of most railway pavement obligations. Such an unknown quantity of taxation makes it necessary, when considering a fair rate of return on capital, to provide a rate of income which will produce the revenue to pay the highest amount this form of taxation may reach.

Reasons somewhat similar to those which actuated Philadelphia may have been in mind when the famous Cleveland 3-cent fare ordinance was drafted, because it seems evident that it would be practically impossible to forecast a net income which would insure even such a low rate of fare if huge and variable sums were to be expended by the railway for pavement taxes. Section 7 of the Cleveland ordinance is as follows: "The company shall maintain in constant repair the pavement within a space 7 ft. in width for single track and for double track the entire space between the outer rails of both tracks, including the space between the two tracks and 1 ft. outside of each outer rail, but in no event to exceed 18 ft., except about curves, special work and where there are more than two tracks in a street, in all paved streets occupied by its tracks, whether such streets were paved at the time of the passage of this ordinance or subsequently thereto; but the company shall not be required to repave by virtue of this obligation to repair, nor by virtue of any requirement of the general ordinances of the city of Cleveland during the continuance of this grant."

It will be noted that the railway is to maintain the pavement in constant repair in a definite track area, but it is not required to repave by virtue of the repair obligation. This distinction is important, and it is understood that under this section of the ordinance the repavement of track following reconstruction thereof is not held to be a burden upon the company, but it is instead an obligation upon the city. Furthermore, it does not seem to require the installation of pavement by the company in new track extensions. In effect, then, the Philadelphia situation is repeated to the extent that the railway company is only required to maintain existing pavement disturbed by it for track repairs and on account of defects only until the complete repavement becomes necessary.

The Philadelphia idea of fixing a definite sum to be paid to the municipality by the railway company in lieu of its obligation to maintain and repair pavement in tracks was antedated by almost ten years in the State of Massachusetts under an act passed in 1898. This provided that the railway companies were to pay a commutation tax to the State for this purpose, excepting that where local franchise obligations provided for caring of the street surface by the railways, this duty was still to continue.

The following quotation from the fourth annual report of the Public Service Commission of the commonwealth of Massachusetts is very interesting in this connection, and particularly in the statements contained therein to the effect that cities should in their own interest seek to relieve the companies of all unnecessary and unjust burdens:

> In view of the present unsatisfactory financial condition of the street railway companies in general, it is imperative that the cities and towns in which they operate should, in their own interest, seek to relieve the companies from all unjust or unnecessary burdens. The importance of such public co-operation was fully discussed by the commission in its decision in the Bay State rate case and what was then said it is unnecessary now to repeat, except so far as it relates to the question of maintaining and repairing the public streets, where action by the general court is desirable. In regard to this matter the commission said:
>
> "In 1898 an act was passed (St. 1898, c. 578) which was clearly intended to relieve street railway companies from the duty, formerly imposed, of maintaining and repairing the street surface within their track locations and to substitute an excise or 'commutation' tax in place of this duty, a tax which the Bay State company now pays. For the year ended June 30, 1914, it amounted to about $210,000. Nevertheless, the investigation in this case of the property accounts and operating expenses of the company has brought to the surface the fact that it has been required, ever since this law was passed, not only to pay the tax, but, with comparatively few exceptions, to do the same work which it was previously required to do.
>
> "The courts have held that the law of 1898 did not in fact exempt companies from the duty of caring for the street surface where that duty was imposed, not by the general statutes, but by provisions in original location grants; but in the many cases throughout this system where the original grants contain no such provisions it develops that the Bay State company has, in effect, been required by various forms of persuasion to continue to do the old work. In securing new locations involved in the laying of double track, or in the reduction of curves or in other respects necessary to the efficient operation of the road, apparently the company has continually been obliged to dicker with the local authorities and finally to agree to perform work upon the streets which the statutes do not require or even contemplate (Record, pp. 4666-4675).
>
> "It is perfectly natural that municipal governments, anxious to keep down the local tax rate by which they are so largely judged, should seek to unload upon the street railway company all possible expense, but such a policy, in the long run, reacts upon the public served. Street railway companies have no mysterious source of revenue, but obtain their funds from the people who ride in their cars. Any burden or tax imposed upon the company these people must ultimately pay. If the tax or burden is unjust it only means, in the final analysis, that a portion of the public is being subjected, by indirection, to an inevitable form of special taxation. Furthermore, the burden is not measured wholly by the cost of the physical work which the company is finally required to do, for the continual dickering over such matters consumes what is, in the aggregate, a very large amount of time and adds materially to the cost of management.
>
> "The importance of this question is shown by the fact that, disregarding such matters as grading, bridge work, etc., the cost of the paving alone, for which the Bay State company has paid since the law of 1898 was enacted and which it has been expected to maintain, is estimated at more than $2,000,000. In a report made to the General Court at its last session, the commission strongly urged that the present system should be changed by eliminating, in effect, the present 'commutation' tax, by placing all paving work squarely in the hands of the municipalities, and by requiring the street railway companies to meet only the reasonable cost of any such work done within their track locations. Whether or not this is the best plan that might be adopted is here immaterial, but at all events it is perfectly clear that the companies ought not to be required to pay the present 'commutation' tax and at the same time do the work for which this tax was supposed to be a substitute."

Brooklyn Paving Data

The area of pavement maintained by the Brooklyn Rapid Transit Company is more than two and a half million square yards which, if ultimately paved with granite or concrete, will be worth $9,000,000.

This is equivalent to a state highway 18 ft. wide and 250 miles long, or to a 30-ft. street 150 miles long.

In the Borough of Brooklyn alone the company spends from a third to a half of a million dollars annually on repaving, besides large sums for miscellaneous paving repairs.

There are many phases of the application and effect of the burden imposed by the existing laws which requires railways to repair pavements, and they are well brought out in an article on "Highway Paving by Street Railways," by W. R. Dunham, Jr., in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 24, 1917. The most important two points made by Mr. Dunham are that the existing state laws covering the subject are very old, dating back to the days of the Civil War, and that their intent was to require pavement repairs but not renewals. He also emphasizes the fact that the present misinterpretations of such old statutes wrongfully impose burdens not warranted by proper application and interpretation of the law.

This last point is important, and actions in the courts in cases of such unwarranted and unlawful interpretations in application of such laws have been decided in favor of railway companies. A typical case of this nature recently reached the United States Supreme Court after having been decided in favor of the United Railways & Electric Company of Baltimore by the Maryland Court of Appeals. In a unanimous decision the Supreme Court upheld the Maryland Court (United Railways Company vs. Baltimore, 127 Md., 660. Baltimore vs. United Railways Company, Supreme Court U. S.—October Term, 1915, Memoranda Cases). The main contentions were upon the interpretations of the word "repair," and the point that repairs could not be construed as repavements. In course of opinion the Maryland Court of Appeals said: "All the grants which have been made to the defendant company since its formation have been made subject to the paving and repairing obligations imposed by the ordinance of 1897, and subject also to the payment of the park tax and other charges fixed by the Board of Estimate under the City Charter. The obligations to pave and repair, where tracks have been laid under that ordinance, have been assumed by the defendant, and it has paid the park tax since its formation, a sum amounting to more than six million seven hundred thousand dollars, and all franchise charges and general taxes and other costs, aggregating large sums, in adapting and adjusting its tracks and paving operations. The defendant is not claiming an exemption from taxation * * *. All of its property is taxed, and it contributes in general taxes to the cost of public improvements and the general welfare of the city large sums of money. It is resisting what it contends to be an unlawful and illegal exaction laid upon it by the act of 1914, Chapter 37."

Another form of unwarranted and improper interpretation of the statute appears in the attempts now being made in New York to construe the word "repair" so as to make it cover the removal and replacement of track pavements in connection with sewer construction and repair undertaken by the municipality. There appears to be an obligation on the part of the railways to remove track structures which may interfere with sewer operations in common with other corporations having sub-surface structures in the streets. It will be seen that it is impossible to remove a paved track without first removing the pavement, involving the destruction of the pavement. But the pavement is not a part of the track, and the railway's duty under the law is only to repair and maintain pavement in its tracks and not wilfully to destroy it for some purpose desired by the municipality. Therefore, if the necessity arises for removal of tracks in such cases it follows that it is the duty of the municipality first to remove the pavement and also to restore the pavement after the track has been replaced. And this duty imposes no hardship on the municipality because it must remove and replace pavements in sewer operations in all streets where there are no tracks. Furthermore there arises the question as to who owns the pavement in the tracks, and P. B. Wittmer, Deputy State Tax Commissioner of the State of New York, in his "Letter to the Editor" appearing in the issue of the JOURNAL for March 10, 1917, says: "The Court having ruled that such investment (in track paving) does not represent tangible property owned by the railroads but is on the contrary the property of the municipality * * *." Hence, if the track pavement is really owned by the municipality it must be its duty to remove it and replace it when necessary for purposes of its own sewer operations.

It is gratifying to know that a case in point has been decided in favor of the railroad companies in a recent decision handed down by Justice Lehman in the Case of the City of New York vs. Whitridge, receiver Third Ave. Railway Co.

EXERCISE OF POWER ARBITRARY

Reference has been made to arbitrary and unrestricted powers conferred on officials to require unwarranted expenditures under the broad terms of most railroad pavement obligations. One instance of what appears to be an attempt to exercise this power unfairly may be cited. A subsidiary of a large street railway corporation operating in New York City has tracks in an outlying street leading to a summer resort. The tracks are over twenty years old and are paved with cobble, a comparatively cheap but serviceable form of pavement which was installed when the line was built. There is and has been nothing but dirt in the street outside the railroad pavement area. There are no proceedings in hand for the construction of pavement in the street by the city. The street and tracks are not at established grade and the tracks will require relocation at such time as the city undertakes to put the street at established lines and grades. Nevertheless the city officials ordered the railroad to repair the cobble track pavement by installing new granite blocks with grouted joints on a concrete foundation in the entire railroad area. Consider the injustice of this so-called "repair" with the foregoing conditions in mind. A pavement costing $3.50 or more per square yard is to replace a cobble pavement. The city hopes to get the use of a first-class pavement 18 ft. wide, about that of a state highway, and it proposes to do nothing itself in its own areas. Needless to say the railroad company is resisting such an arbitrary misuse of powers conferred upon the city officials.

In Connecticut there is a statute which prevents such a misuse of power. Section 3837 of the General Statutes reads in part, as follows: "Such authorities shall not order such company to use any better or more expensive kind of pavement or material for that part of the highway which it is the duty of such company to keep in repair, than is used by the town, city or borough upon the remaining width of the highway, except for a space of one foot on each side of each rail, unless such better or more expensive kind of pavement or material was required in the order permitting the original location of such railway on such highway."

TRACK PAVING IS RAILWAY TAXATION

Mr. Dunham in course of his article says: "To assume that this paving burden is of the nature of a franchise tax is erroneous * * *," and then he proceeds himself to discuss the burden as a tax. Webster says in definition of the word "tax" that it is "a charge, especially a pecuniary burden imposed by authority; a task exacted from one under control." But we do not have to rely solely on the dictionary for affirmation of the correctness of the opinion that the paving burden of the railroad is a tax. It was recognized as such in the Philadelphia ordinance quoted. It has been recognized as such by the State Tax Commission of the State of New York in connection with the taxation of the intangible element of special franchises, as stated by Mr. Wittmer in his letter previously referred to. Attorney B. L. Spahr, in an article on "Taxing Electric Railways" in the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 16, 1916, calls the paving requirement a form of local taxation comprised in requirements in municipal ordinances and says in part: "An annual tax on cars or other property may be imposed as a condition of consent. The usual form, however, is a provision requiring either the paving or repairing of streets, or both." But the courts have also construed the obligation as a tax in the important case of the City of Rochester vs. Rochester Street Railway Company (182 N. Y., 99) in the opinion by Chief Justice Cullen, which says, among other things: "The provision of the General Railroad Law (Laws of 1890, Chapter 565, Section 98) requiring street railroads to pay the cost of paving between their tracks is an exercise of the taxing power of the legislature."

The present standard classification of accounts charges paving to capital under the construction accounts and to operating expense in operating accounts under the general head of "Maintenance of Way & Structures." The question arises as to whether those classifications are correct. In the first place the courts have ruled that investment in pavements does not represent tangible property, and it seems improper to capitalize intangible property. But if the pavement requirement attaches to a franchise and is in the nature of a tax or payment for such franchise it must certainly be allowable to capitalize the cost of the pavement under the head of promotion expense or legal expense as a part of the intangible value of said franchise. In any event the investor and public should know that only about one-half of the total cost of a newly-paved track structure is for the track and that the other half represents the pavement cost which in turn is in reality a heavy tax or payment for the franchise.

Again, if the cost of maintaining pavements which produce no income is a tax it would seem to be improper to charge it to paving under operating expense, because all other taxes are not so charged but instead are placed under the general head of "Deductions from Income: Taxes." It would be better for all concerned to classify the paving maintenance account under the head of "Taxes: Paving Account," thus putting the item squarely into the accounts as a tax, where it more properly belongs.

CONCLUSIONS

The foregoing discussion of paving matters has been presented with the view of bringing out some features of a form of taxation which are not often thought of as such and some conclusions may not be out of place, as follows:

1. Existing statutes requiring pavement construction and repair in tracks are in urgent need of revision so as to render them more in accord with the present conditions.
2. Existing paving ordinances and regulations of municipalities which attach to railroad franchises also need revision. In fact a basis should be found whereby an equitable franchise tax of a fixed form can be substituted for the present inequitable and variable paving obligation.
3. If relief could be obtained from the entire paving burden except for such expense as is caused by constructing new tracks in existing pavements and by repairs or renewals occasioned only by track repair or reconstruction, such relief would greatly assist the railroad companies.
4. The present pavement requirements are unjust to the car rider because he alone pays for pavements which he does not use and his fare now assists in paying other people's taxes in helping to provide pavements for business and pleasure vehicles to use. Such facilities should be paid for by the entire community.
5. Statutory pavement requirements should be considered as franchise taxes and, as such, they should be classified in the accounts. The paving requirement is a constant liability. From the very first the money invested in track pavements is an investment in franchise taxes and this money is all expended in creating a source of endless future taxation now expended under the guise of paving maintenance.

The capital stock of the United Railways Savings & Loan Association, composed of employees of the United Railways, St. Louis, Mo., has been increased from $2,000,000 to $2,500,000, being the third increase since the organization in 1915. The original capitalization was $1,000,000. The association has 2400 members, who are saving $25,000 monthly. Thirty new homes have been built for members, and sixty-five other homes purchased. Loans have been made to 190 others.

Co-operation Between Transportation and Equipment Departments

In order to impel platform men to assist in reducing equipment maintenance costs, H. W. Irwin, superintendent of car repairs Bay State Street Railway, recently furnished to *Bay State Triangle Talks* the following suggestions:

Ways in Which Motormen Can Save Money for the Company.

By notching the controller properly. This will save power and lengthen the life of motors, gears, controller and car body. It will reduce accidents, conduce to public comfort through smooth acceleration, create a better-natured conductor who will work more efficiently, and save some time.

By proper operation of the air-brake valve. This will save power and reduce wear and tear on air-brake and other equipment, and car body; will prevent accidents, create better public attitude through smooth braking, reduce number of flat wheels, save brakeshoe wear and make the conductor happy and cheerful, and therefore efficient.

By running slowly over special work and railroad crossings. This will save flanges, trucks, etc.

By not running on resistance, a common habit.

By using switch sticks as they are intended to be used; not as crowbars, sign sticks or ice chisels.

By being careful not to break windows when switch sticks are hung on front of car.

By opening and closing vestibule doors and windows properly.

By pushing in or holding up fenders before car is put in carhouse.

By watching clearance for double running boards, steps and arc headlights on corner of dashes.

By not running on three motors.

By proper handling of sand pail, scoop, motorman's seat, etc.

Ways in Which Conductors Can Save Money for the Company.

By giving proper signals. This will reduce accidents, save time and promote co-operation from the motorman.

By not slamming seat backs when turning, which loosens, mars and breaks them.

By not trying their strength on the register and bell cords.

By not dropping hinged fenders but rather lowering them carefully.

By not slamming double running boards down or up.

By not throwing and dropping tail lights.

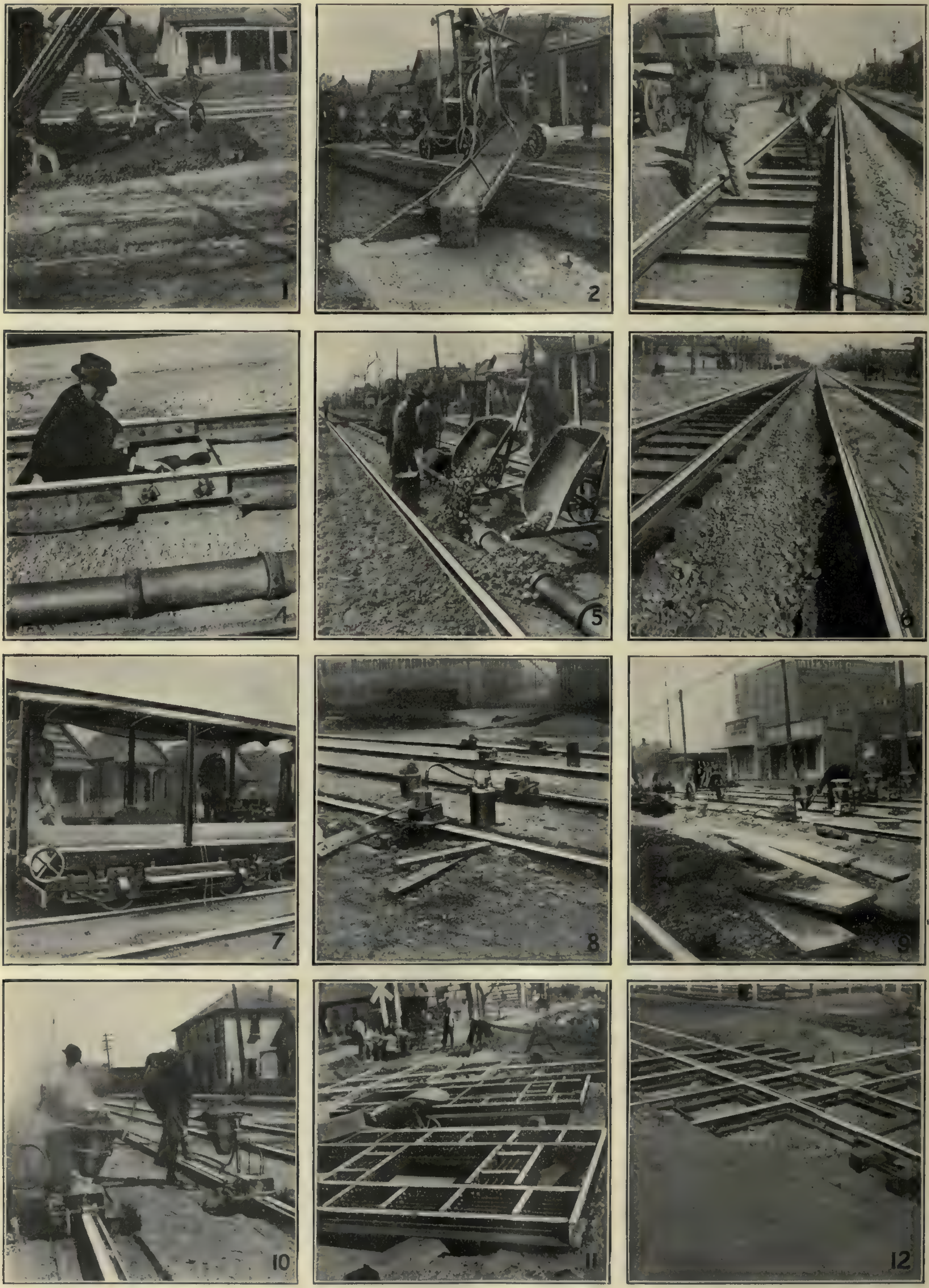
By turning off heaters when not required.

By handling adapter signs properly, not throwing them on the ground at the carhouse or under seats in the car, but rather placing them in the sign box.

By careful handling of sign sticks, flags, brooms, and pails and scoops.

Increase in Earnings

The earnings of the Arkansas Valley Interurban Railway, Wichita, Kan., practically doubled in 1916, on a 21 per cent increased mileage. The road is also showing gains this year over 1916. The freight business, which is about 12 per cent of the total, is increasing at practically the same rate as the passenger business. It is an interesting fact, in view of the passenger increase, that Sedgwick, Harvey and Reno, the three counties served by the interurban, have 11 per cent of the automobiles owned in the 105 counties of Kansas.



TRACK CONSTRUCTION SCENES IN DALLAS, TEX.

Illustrations Showing Methods of Preparing Roadbed, Welding Joints, Setting Steel Ties and Draining Track

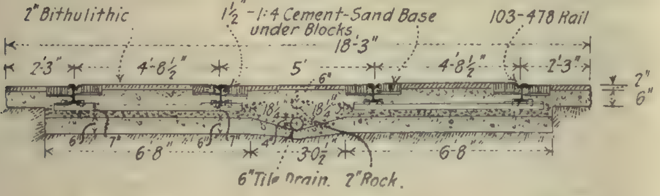
A Modern Type of Track Construction

Welded Joints, Steel Ties and Tile Drainage System Play Important Parts in New Track Work—The Author Describes the Methods Employed in Rebuilding the Recently Completed Double-Track System of the Dallas Consolidated Electric Street Railway

By R. G. TABER
Superintendent of Construction Stone & Webster Corporation, Dallas, Tex.

DURING the last few years track construction in permanently paved streets in Dallas, Tex., has been through a revolutionary stage, many new features being introduced, such as the Goldschmidt Thermit welded joints, International twin steel ties, gravel ballast with longitudinal tile drains, and numerous smaller details.

It is not the intention of the writer to describe in this article what he considers the best type of track construction, for during the last twelve years of his connection with city street railway track work many concrete opinions that were formed have been "knocked into a cocked hat." There still exist considerable differences of opinion as to what constitutes the best type of track construction on permanently paved streets, not only in Dallas but also in other cities. It has been proved here, and elsewhere as well, that the concrete beam construction without ties of any nature is an absolute failure. Another type, namely, the solid concrete construction with 6-in. concrete base under 6-in. x 6-in. wooden ties, spaced on 4-ft. centers, is not considered successful by all engineers, even though it is conceded to be far better than the beam construction. The rail becoming loose, either from cutting down into the tie and concrete or from pounding joints, which in the majority of cases is the cause of all loose rails, starts a pumping action, destroying the paving foundation and paving surface adjoining the rail. It is impracticable to break out the concrete for repairs, especially where operation has to be maintained. The solid concrete construction gives a very firm roadbed, to be sure, but in my opinion this rigidity plays an all-important part in the production of corrugation; in fact, this is considered by some to be the primary cause which creates this condition. Of course, there is corrugation to some extent on street railway tracks not laid with the concrete foundation, but not so much and it only occurs where the track has been down for some time and the ballast under the ties has become compact in place, thus losing its resiliency.



CROSS-SECTION OF NEW TRACK IN DALLAS, TEXAS

With the knowledge of these defects before us, our problem was to design a track adequately drained and resilient to a certain degree, and to eliminate the well-known trouble starter, the joint. In other words, we were trying to find that type of track construction of low first cost, which gives a long life with least maintenance cost. Whether or not the type of construction which the writer is about to describe is one of this class can only be answered by time, which condemned the beam construction and brought out the defects of the solid concrete construction.

On Jan. 3, 1916, the rebuilding of the double track of the Dallas Consolidated Electric Street Railway on Commerce Street from the H. & T. C. R. R. to Exposition Avenue, a distance of approximately 4800 ft., was started. The street was originally laid with Carnegie 77½-lb. low T-rail in macadam paving. The old track was torn out with No. 19 Barrett track jacks, and the rails were hauled about 1 mile and stacked at a cost of approximately 10 cents per lineal track-foot.

USE OF STEAM SHOVEL PROVES IMPRACTICABLE

The excavation, which was sub-contracted, was then started, and an attempt to do this with a steam shovel, as shown in photograph No. 1, was made, but to no avail, on account of the shallow cut. The shovel would take the street down only to within a tenth of the proper sub-grade and then it was necessary to dress off by hand. After a trial for two blocks the steam shovel was taken out, as it proved to be too expensive. It might be well to state here that as soon as any section of the ditch was completed, tile laterals, that were to connect to the main tile drain in the center of the completed track, were connected to the storm sewer inlets. This was done to drain the ditch in case of rain as quickly as possible and thereby to avoid delaying the work—just a little safety-first in actual construction. The ditch sloped from the outside edge toward the center. This was done to throw all seepage water into the drain and to avoid any puddling of the sub-base directly under the tracks. The trench completed, concreting was started as shown in photograph No. 2. This consisted in placing a 6-in. concrete sub-base or concrete mat, the aggregate being bank run gravel of the proper proportion, which was lined out along the side of the trench in convenient amount. The concrete mixer, a Koehring traction paver, used this gravel as the concrete was poured. Precaution was taken to have the slab slope toward the drain in the center to prevent any water from collecting under the ties and thereby causing the ballast to become mucky.

STEEL TIES USED

After this sub-base had set for about five days, the International twin steel tie was placed upon it on 6-ft. centers and the rails fastened thereto, as shown in photograph No. 3. The cross-section reproduced herewith shows the general detail of track construction used. The rail was the Lorain Steel Company's section 103-478 grooved girder with the latest curved head, this curved head being considered another aid for the prevention of rail corrugation. The rails were held together with 2-in. x 6-in. temporary wooden splice bars with a ¾-in. "dutchman" separating the rails, as shown in photograph No. 4. These joints were later welded. After the rails and the ties were in place, the ballasting followed. The method used in pulling the ballast into the track was described in the Jan. 6, 1917, issue of the Electric Railway Journal. It consisted in fastening one end of a rope to a scraper, passing the rope through a pulley which was hooked over a rail of the adjoining track, and tying the other end to a car. The scraper was taken out beyond the dirt pile and the car was started, causing the scraper to be pulled in toward the track, gathering a load of ballast as it came. The old adage that "necessity is the mother of invention" again proved to be true. Upon discovering that shoveling the ballast by hand was costing 12 cents per cubic yard and at that rate the item of ballasting would overrun the cost allotted, the above-mentioned scheme was resorted to, thereby reducing the cost to 5 cents per cubic yard.

Tile Pipe Used to Drain Ballast

While the ballast was being placed, the 6-in. tile drain in the center of the track (see photographs Nos. 5 and 6) was installed. This tile was laid with loose joints, covered with 2-in. rock, the tile being tapped off with a lateral to the inlet boxes in the gutter at approximately every 1000 ft. and then connected to the city's storm sewer as previously stated. When the ballast was placed the track was lined, surfaced and tamped to the proper grade. While the surfacing and tamping were being done on one track a water car filled with water and weighing 75,000 lb. was operated over the track previously tamped. These operations were carried on alternately until the slightest depression in the surface was cleared up and the tracks remained in good condition as to line and surface, care being taken that the ballast was thoroughly dampened while being tamped. The water car was operated over the track approximately ten hours prior to the laying of 6-in. concrete paving foundation, and by this means the ballast under the ties was thoroughly settled. The concrete paving base was then poured in the same manner as was the sub-base. At each joint concrete was left out to allow for welding.

Welded Joints Used

Two days after the concrete paving base had set up the welding was begun, the temporary wooden fishplates being removed and the joints cleaned preparatory to the welding. The type of weld used was the Goldschmidt Thermit, as stated before. This method consists briefly of placing an insert in the ¾-in. opening left when the rails were placed, the rail being thoroughly cleaned and molasses asbestos strips applied around it about 2½ in. from the joints. Molds were made by the molder (photograph No. 7) and were then luted (photograph No. 8) after they had been made fast to the joint. The joint was then preheated (photograph No. 9), and in the meantime crucibles were made ready to pour when the rail ends were heated to a cherry red heat. The joint was then poured (photograph No. 10), after which it was dressed down by the grinder to the completed joint. The paving, which consists of a 2-in. surface of Bitulithic pavement with two rows of 3½-in. x 4-in. x 8-in. creosoted wooden blocks on each side of the rail, followed close behind the welding, and the job was finally completed on May 1, 1916.

Foundations for Crossings

In connection with this job, there were installed under one single-steam double-electric manganese crossing and one double-steam double-electric manganese crossing, the International twin steel crossing foundation. Photograph No. 11 shows the steel foundation for the single-steam double-electric crossing inverted, ready for concreting. Photograph No. 12 shows the crossing in place on the foundation.

Review of Workingmen's Compensation Acts

The National Industrial Conference Board has just published a report entitled "Workingmen's Compensation Acts in the United States—the Legal Phase." According to this report, thirty-seven states and four territories of the United States now have such compensation laws, and the principal of workingmen's compensation applies to more than two-thirds of the wage earners of the United States. A striking feature of these acts are their inconsistencies. One source of conflict among them is the significance given to the term "accident." In the English compensation act, largely used as a basis for American legislation, the liability is expressed by the phrase "personal injury by accident arising out of and in the course of employment." In the compensation acts of fourteen states, this language is followed identically; in others, the words "by accident" are omitted, thus broadening the liability; in some cases the words "out of" are also omitted, further extending the liability to cover injuries received in the course of employment, although the occupation has no direct connection with the injury. For instance, the Ohio Industrial Commission awarded compensation to the dependent of a stenographer because, while taking dictation from her employer, she was murdered by a jealous suitor; the New York Industrial Commission awarded compensation for the death of a street railway process server from gangrenous diabetes, alleged to have resulted from having his toes trodden upon by a fellow-passenger in a street railway car of the company which employed him.

Several important constructive suggestions are made in the report. The first is that the various states, in order to reduce existing conflicts and uncertainty, immediately undertake to establish a permanent scientific and uniform system of compiling accident statistics. This would be a great step toward determining definite standards of liability and equitable compensation rates and would enable legislators to judge the real hazards of various occupations and "permit the just extension of the compensation principles to many workers now arbitrarily excluded from its terms." A second is that a clear distinction be drawn in statutes between "occupational disease," "accident" and "injury."

This report on the legal phase of workingmen's compensation act is to be followed by other reports on the medical, economic and administrative phases. The National Industrial Conference Board, whose headquarters are at 15 Beacon Street, Boston, is also conducting investigations of various other industrial problems on which reports will be issued in due course.

New Haven to Curtail Schedule

The New York, New Haven & Hartford Railroad plans to reduce its schedule by 199 passenger trains a week, subject to consideration with the public service commissions of Massachusetts, Connecticut, Rhode Island and New York, in compliance with the orders and suggestions of the special committee on National Defense of the American Railway Association. This curtailment is to be made in order to provide for the maximum movement of fuel, food, supplies and troops necessitated by the war. Of the total number of trains to be eliminated, 157 are weekday trains and forty-two Sunday. The curtailment of this service will be made where there will be the least interference with travel, and by discontinuing trains the patronage of which is light. The Massachusetts Public Service Commission ordered a hearing to consider the proposed curtailment of service.

How the Costs of Rendering Service Are Steadily Going Up

Comparison of Reports from a Number of Electric Railway Companies in All Sections of the Country Show Marked Increase in Materials and Labor—Statistics Are Given—The Effect of the War

By IVY L. LEE

IVY L. LEE

THE electric railways constitute the one great American industry which has so far been unable to adjust its prices to the increased costs of the last few years. The point has been suggested that electric railways should not seek exemption from the burdens of the war by imposing added charges upon the public. The fact is that electric railways are the only industry which so far has been unable to adjust itself to the burdens imposed before America entered the war.

Added costs incident to America's entrance into the war remain to be seen. The increased costs already encountered are not a result of the war—they are the result of a revolutionary change in all economic conditions which has been going on for the last ten years and which has become particularly acute during the European war.

It is the tendency which at the moment is at work which is the most dangerous factor in the situation. That tendency spells immediate bankruptcy for many companies; it spells danger in the future for very many more.

The world is undoubtedly approaching a state of economic exhaustion. The stock of what economists call the "consumable wealth" is being used up. That means that all the additional articles which are produced are, measured in terms of money, much more precious.

The vital fact relating to all commodities to-day—and street railway traffic is a commodity as much as anything else—is not only that the service or commodity itself is more valuable but that the dollar with which these commodities are purchased is very much less valuable.

Every industry in the world today is on an absolutely new basis. Revolutionary influences are at work. To disregard these influences, to refuse to admit the change in the economic weather which the barometric indications of the times undoubtedly foretell, is to do nothing less than to invite disaster.

The operation of every business is subject to a certain arithmetical equation which can no more be denied than can the oncoming of the tides. That equation is this: You cannot subtract a greater sum from a lesser.

If the street railway service of this country costs an average of 6 cents per passenger, that cost will have to be paid. The public may take it upon itself in the form of taxes rather than imposing it upon the person who uses the service. But that does not alter the fact that the bill will have to be paid. An essential part of that bill is the cost of obtaining the capital with which to render the service. These are economic considerations of the most fundamental character, yet it is astonishing how many public officials remain blind to them.

To find out just what the facts are, and especially the tendencies which are at work, the ELECTRIC RAILWAY JOURNAL recently addressed a questionaire to a large number of electric railway operating companies in different parts of the country. The results of these inquiries are most interesting. They are primarily indicative of the tendency. The actual figures do not yet disclose the results of the abnormal influences which are at work with steadily increasing intensity. But what has happened is startling enough.

It may be that particular companies will show favorable results even under present conditions, but to arrive at a sound conclusion as to the industry as a whole, fundamental tendencies universally at work must be studied. If those fundamental tendencies are undermining the industry, is it not vital to the industry as a whole that steps be taken to neutralize these tendencies? That can only be done by arranging that the public shall pay the increased costs for the service it is receiving.

Below will be found a recapitulation of the reports received from all over the country.

LABOR AND SUPPLIES

The cost of labor to electric railway companies may be very roughly stated to have risen during the past five years by about 25 per cent. This estimate is based upon returns from eighteen states and, if anything, is below the mark. The change in the wage factor has been less in the West than in the East. An electric railway operating on the Pacific Coast, for instance, reported that the added burden of increased labor cost was about 10 per cent. At the other extreme are Pennsylvania and Connecticut, where the demands of the steel plants and munition factories at times made unskilled labor almost unobtainable. In Pennsylvania one company reports having had to pay an increase of 100 per cent for common labor employed in track laying and other construction work, and from Connecticut comes a report showing an increase of 60 per cent for this labor.

The rise in wages of semi-skilled labor has been less, but taking the average motormen, conductors, yard hands, etc., the following increases may be accepted as thoroughly conservative: In Missouri, from 15 per cent to 20 per cent; Indiana, 20 per cent to 25 per cent; Wisconsin, 20 per cent; Maryland, 25 per cent to 30 per cent; Georgia and Massachusetts, about 30 per cent; Connecticut, from 17 per cent to 40 per cent; California, from 25 per cent to 45 per cent; Maine, from 15 per cent to 50 per cent, and Pennsylvania, from 25 per cent to 60 per cent.

The cost of materials and supplies used by electric railway companies has increased at least 42 per cent in the last three years. This is indicated by comparing 313 items used by eighteen different corporations scattered all over the United States.

While weighted averages are not available, the following table shows the classification of the items, the number considered under each classification and the average per cent increase in present price over the price paid during the first half of 1914:

Division		Number of Items Considered	Average Per Cent Increase in Price Last Order Over Price Paid First Half 1914
1	Car truck parts	35	28.8
2	Car motor parts	35	41.1
3	Car controller parts	21	33.3
4	Car air brake parts	20	6.7
5	Car headlight parts	13	42.8
6	Car trolley parts	16	66.8
7	Car circuit breaker and contactor parts	6	49.3
8	Car supplies—Miscellaneous	43	38.4
9	Car parts—miscellaneous	20	20.4
10	Paint, varnish, etc	16	43.0
11	Wire, miscellaneous	8	38.0
12	Nails, screws, iron, etc	17	113.9
13	Track material	14	56.1
14	Overhead line material	25	38.4
15	Miscellaneous tools and supplies	24	51.0
		313	....
	Grand total for 313 items	..	42.0

In some parts of the country the total average increase seems to have been less; in others it is considerably more. The figures vary from 25 per cent increase on the Pacific Coast, to 50 per cent increase in the Eastern states. Some of the individual items have soared out of all proportion to the aggregate. Paints and varnishes, from linseed oil to English vermilion, have gone up, the former, 140 per cent, the latter, 470. Wire goods from nails to magnet wire have risen from 100 per cent to 150 per cent. Brakeshoes are up 200 per cent, and in some cases steel castings and tool steel have also trebled in price.

Steel rails have steadily risen and current prices vary from 30 per cent to 42 per cent above 1912 quotations. Rail bonds are up 80 per cent, and fastenings and points and pole-line hardware show similar increases. Ties have risen from 25 per cent to 40 per cent, and all lumber shows heavy advances, creosoted pine poles now being 75 per cent above what they were five years ago. It can be stated as an absolute fact that a car costing less than $5,000 only three years ago costs to-day something in excess of $8,000.

The costs of materials are steadily rising. The prospective shortage in industrial labor will be reflected in progressive increases in material costs. To the extent that the government absorbs commodities necessary for the war there is an increased price which must be paid by the electric railway company for its materials: it is a direct burden of the war.

FUEL AND TAXES

Fuel has undergone and is undergoing an extraordinary increase in value. Of course, to some extent many corporations have been protected by long-time contracts or supplied with hydroelectric power, but those which have had to rely mainly on coal and have had to go into the open market and make their purchases, have paid as high as 100 per cent more than they did five years ago. One corporation in Connecticut was caught short during the worst period of last year and paid 360 per cent more for coal than the 1912 price. Another corporation in Ohio and one in Maine paid 200 per cent more, and all over the country increases of from 45 per cent to 100 per cent in fuel costs have been common among inadequately protected corporations.

New fuel contracts for next year are being made. In this item is to be found one of the most serious menaces to railway income accounts.

Taxes have increased on an average about 40 per cent in the last five years. Electric railways in Connecticut, to be sure, have benefited by a change in the law, and now that the assessment is levied by a percentage tax on gross revenue the taxes paid by the company have decreased about 6 per cent.

On the other hand, electric railway taxation in California has increased 269 per cent in ten years. Varying municipal taxation in different cities accounts for one corporation in the Middle West paying only 25 per cent increase over the taxes of five years ago, while another corporation in the same state but in a different town has seen its taxes increased 84 per cent in the same time. Cities in Ohio have been particularly severe on electric railways, the increase having been nearly 80 per cent.

SPECIAL EXPENSES DUE TO REGULATION

Most of the companies canvassed do not appear to keep very accurate track of these costs which, of course, fluctuate with irregularity. Some corporations seem to think that the expense to them of public regulation is trifling compared with the materially improved service and more up-to-date operation which it has secured. Others advance the theory that much of the time of highly-paid executives and experts is frittered away at public hearings on frivolous complaints.

Some states require very full reports and valuation returns, and in California the cost of compiling these is estimated by one corporation as having exceeded $100,000 since 1912. Some companies which make a separate accounting of the cost of public regulation place it as high as 2 per cent total gross operating expenses.

The cost of regulation, however, cannot be considered an abnormal burden. The results of regulation are too valuable. But the cost ought to be borne in mind as a fact; the benefits accrue to the public quite as much as to the companies.

LOSSES FROM COMPETITION

The general public has no conception of the enormous losses caused to the electric railways by the competition of the pleasure vehicle and the too often derided jitney bus. The estimates of various corporations differ widely, but a careful study of actual figures leads to the conclusion that every pleasure vehicle takes 25 cents a day out of the gross traffic receipts of the electric railways of the city in which it is run. In some cases in the Western states the aggregate loss amounts to 25 per cent of the gross traffic receipts.

In large cities like Boston and St. Louis, where the companies have made an effort to keep careful track of this factor, the loss runs from $3,000 to $4,000 a day. In Boston, where this loss has been subdivided, it is found that the jitney takes 6,000,000 nickels a year from the electric railways, and the automobile 22,000,000 nickels a year, a total loss of $1,400,000.

It will thus be seen that the added burden of the increase in cost of labor and in cost of materials and supplies combined with the ever-growing competition of jitney buses and automobiles, has been such in the last five years that it is only by paying the closest attention to economy and operating efficiency that many electric railways have been able to continue operation at all on the present 5-cent fare.

EFFECT OF THE WAR

The entry of the United States into the war will undoubtedly have a further adverse effect upon their economic situation. This country hardly realizes as yet that it is at war, but as the part taken by the United States in the actual conflict grows more and more important, war conditions will very rapidly press themselves upon every phase of our industrial and commercial life. The electric railways will be principally affected by the decrease of their earning power and the increase of their costs of operation.

It cannot be doubted that war conditions will increase the cost of labor and bring about higher wages, because all over the country the demand for semi-skilled labor in mechanical trades will be greatly increased, and this will mean a corresponding rise in wages.

There is no reason to doubt that the present ascending scale of prices will be maintained not only until the end of the conflict but perhaps for two or three years after the restoration of peace.

Increased taxes will also be inevitable. The tendency among the national, state and municipal legislatures is very clearly toward increasing the taxes paid by corporations.

If costs will continue to soar under war conditions, the earning power of the electric railways will also be decreased. A great many trained men have already joined the colors and the selective draft will in many instances take young men between the ages of twenty-one and thirty whose places it will be impossible to fill. This factor reaches all through every branch of electric railway operation from the clerical forces in the president's offices to the unskilled labor in the construction department, but it will perhaps be most keenly felt in the engineering, mechanical and operating branches.

Besides the men called to the colors, others undoubtedly will be attracted by the higher wages offered elsewhere to fill the labor shortage in other mechanical trades. All this will lead to decreased efficiency of the operating forces and disorganization in the staffs. The net result will be a decrease both in the quality and quantity of labor which in turn cannot fail to decrease earning power.

Another factor which must not be lost sight of is the freight situation. Car shortage and embargoes will lead to deferred delivery of materials necessary to the maintenance and construction. There can be no doubt that in order to move the crops and handle the food situation as well as transport the enormous quantities of supplies which the government must have, it will be necessary to impose embargoes upon freight not essential to the conduct of the war.

* * *

The foregoing covers in a very general way a statement of the more fundamental factors which are at work. It is our purpose next week to print specific replies received, although the names of companies, according to our agreement, will be withheld. It is of moment that this whole question should be considered broadly on its merits rather than be judged with reference to merely local considerations or prejudices.

War Preparations Effect Traffic Increase

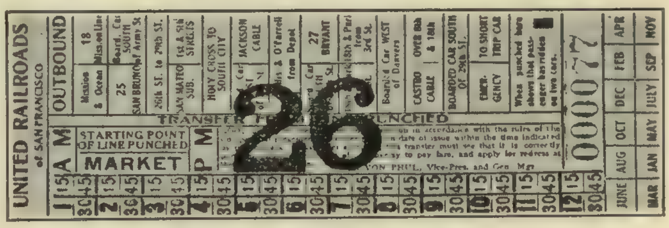
Since war preparations began the United States Quartermaster's Depot at Jeffersonville, Ind., has increased greatly in importance. From a few hundred, the number of seamstresses called there for work has been swelled to several thousands. The Louisville & Southern Indiana Traction Company, issuing transfers from the New Albany-Jeffersonville line to the Jeffersonville city car running to the depot, carries many from New Albany. The large amount of sewing has interested women on the Kentucky side of the river, and hundreds daily cross for the bundles of white canvas distributed by the depot. The cross-river service has been from station to station, and the jitneys began to monopolize the business from the Jeffersonville station to the government depot. A swarm of them entered the field, and prospered until the railway instituted a through service from the interurban station at Louisville to the government depot in Jeffersonville, fare 10 cents each way, with the result that the jitneys have virtually been put out of business. They swarmed to such a degree that the chief of police of Jeffersonville sought to have the City Council enact a $25 license ordinance. In this attempt, however, he failed.

Eight Transfers for Fifty-two

How United Railroads of San Francisco Has Mitigated the Terror of Transfer

LIKE other railways, the United Railroads of San Francisco has never lost sight of the losses due to the reckless and wrongful use of transfers. However, the rising cost of railroading, including the increase in paper itself, recently proved an extraordinary stimulus for improvement. In consequence a new transfer has been adopted, which reduces the varieties of transfers from fifty-two down to eight, as it is not necessary to have a separate transfer for each line.

Aside from this saving, the new transfer has also decreased the average number of transfer complaints from eight a day to that number per month. It has also cut the average length of ride because it has helped the transfer passenger to take the shortest route to his destination. Another advantage is that it is used by front-end street collectors, who identify their issues by perforating the section marked "Extra Conductor."



GROUP STYLE OF TRANSFER—SAN FRANCISCO

All the routes of the company are divided into four groups: Group 1 comprises all lines terminating at Market Street Ferry. On this group a yellow transfer is used for inbound passengers and a white transfer for outbound passengers. These transfers show issuing group and the destination.

Group 2, of routes, comprises the lines terminating at Market Street or at the Southern Pacific Depot. Here, too, inbound transfers are yellow and outbound transfers are white.

Group 3 comprises the lines crossing Market Street. Pink is used for northbound and orange for southbound transfers.

Group 4 comprises short-trip or feeder lines. On these lines only one (white) transfer is required as the punch showing the destination takes care of the direction.

These groups call for seven varieties of transfer. The eighth variety is that issued at the corner of Kearny and Polk streets to the Municipal Railway on Geary Street. This transfer is yellow.

Passengers understand now that one transfer will enable them to ride on three cars when necessary. The conductor of the second car validates the transfer by punching the section which reads: "When punched here shows that passenger has ridden on two cars.' This transfer so validated is taken upon the third car. No record of this intermediate travel is made by the conductor of the second car inasmuch as the transfer itself tells the story.

From the third car a passenger can transfer to a feeder connection by asking for a short-line transfer. There are, of course, certain exceptions to prevent doubling back, but these are few and readily understood by all concerned.

Third Avenue Opens Fare Case

Opening Hearings Before the New York City Commission Deal with Counsels' Arguments Regarding Power of the Commission and with a Presentation of Financial Exhibits

THE campaign for increased electric railway fares in New York City was begun in earnest on Monday, June 18, with the opening presentation of the case of the Third Avenue Railway to the Public Service Commission for the First District of New York. The hearings continued all day Tuesday, and were scheduled also for Thursday and Friday.

From the very beginning it was evident that counsel for the city intended to oppose the company upon every conceivable ground. It was apparent that an attack would be specially directed against the company basing its case upon a reorganization valuation made in 1910. Furthermore, questions were raised as to how the refusal of the company to obey a depreciation order of the commission in 1912 should affect its calculations of a fair return, and as to whether the present financial condition of the company is to be permanent or is merely the temporary result of the long strike in the second half of 1916. The city challenged the power of the commission to increase rates and in general took technical exceptions to the company's exhibits upon the ground of irrelevancy.

OPENING STATEMENT BY COMPANY

In his opening statement for the Third Avenue Railway, Alfred A. Cook pointed out at length the financial ills of the company and the reasons for its application for relief. He outlined from statistics, later presented the steady decrease in receipts and the increase in expenses during the last few years, and said that even the desired 2-cent charge for transfers might not prove sufficient. Such relief would help, however, and all that the company desired was plain, simple justice. It was not asking for stock dividends, Mr. Cook said, but for a fair return on its honest physical valuation so as to avoid disintegration of the property.

Mr. Cook averred that under the Public Service Commission law the commission has power to increase rates so as to give a fair return. In his opinion the Ulster & Delaware decision by the New York Court of Appeals shows this conclusively. He referred to a recent decision by Charles E. Hughes as referee in a Brooklyn Borough Gas Company case, to the effect that the commission cannot increase rates above the 80-cent maximum prescribed by law. He explained, however, that the Public Service Commission law contains a specific mandate limiting commission jurisdiction over gas rates, but that no such prohibition exists in the case of electric railways, and the commission can act in exercise of the fully delegated power of the legislature either to lower or raise their rates. Mr. Cook also mentioned the North Shore Traction Company decision as showing that franchise rate provisions must give way when the legislature speaking through the commission believes that a carrier is receiving less than a fair return.

CITY MOVES TO DISMISS CASE

Ernest E. Baldwin, special counsel for New York City, challenged the jurisdiction of the commission to grant the relief asked and also the competency and the adequacy of the company's petition. He asserted that if the company needed justice it must look to the Legislature. Moreover, if the commission had jurisdiction in the matter, the company's petition should show, first, that the present rates are insufficient, and, second, that they are unjust and unreasonable. If the existing rates are insufficient, the strike of last year is the cause, for operating costs have been about constant. In his opinion, therefore, the rates are not unjust or unreasonable. Chairman Oscar Straus refused to dismiss the company's petition, but stated that he would take under advisement Mr. Baldwin's motion regarding the power of the commission.

COMPANY REVENUES HAVE DECREASED

In support of its petition for relief the Third Avenue Railway filed various financial exhibits, some of which

TABLE I—CONSOLIDATED INCOME STATEMENT OF THIRD AVENUE RAILWAY FOR THE FOUR MONTHS ENDED APRIL 30

	1917	1916	1915	1914
Car mileage...	11,028,903	11,335,485	11,458,284	10,733,942
Operating revenue:				
Transportation ..	$3,236,709	$3,407,895	$3,285,729	$3,098,647
Advertising	26,666	26,666	26,666	36,833
Rents	56,478	54,851	56,491	63,631
Sale of power....	14,391	14,127	8,054	36,911
Total operating revenue	$3,334,246	$3,503,542	$3,376,942	$3,236.024
Operating expenses:				
Maintenance of way	$256,766	$193.144	$227.492	$266.818
Maintenance of way — Removal of snow, ice and sand	61,827	123,974	48,645	143,498
Maintenance of equipment	253,429	201,711	222,647	230,221
Power	329,539	259,591	264,451	262.311
Operation of cars	1,015,438	976,027	944,350	922.136
Injuries to persons and property..	306,929	251,278	211,130	260,975
General and miscellaneous ...	151,904	175,254	167,536	156,521
Total operating expenses—not including depreciation ..	$2,375,835	$2,180,983	$2,086,254	$2,242,483
Net operating revenue	$958,411	$1,322,558	$1,290,687	$993,540
Taxes	276,594	295,191	242.694	239,434
Operating income.	$681,816	$1,027,367	$1,047.992	$754,105
Interest revenue...	55,549	54,616	26,416	26,844
Gross income...	$737,365	$1,081,983	$1,074,409	$780,950
Deductions from income:				
Interest on underlying mortgage bonds	$182,693	$182,693	$182,693	$187,808
Interest on first refunding bonds	293,206	293,206	266,266	232,406
Interest on adjustment mortgage bonds ..	375,600	375,600	375,600	375,600
Interest on notes payable	1,498	2,101	3,192	41,391
Track and terminal privileges	4,553	4,734	4,813	4,386
Miscellaneous rent deductions	3,339	4,176	5,564	5,036
Amortization of debt discount and expense...	6,148	4,295	972	972
Sinking fund accounts	11,160	10,000	10,000	10,000
Miscellaneous ...	8,550	7,990	2,932	2,560
Total deductions	$886,750	$884,798	$851,935	$860,162
Net income—not including depreciation	*$149,384	$197,184	$222,373	*$79,212
Deduct depreciation reserve	....	....	189,680	170,000
Net income	*$149,384	$197,184	$32,693	*$249,212

*Deficit.

TABLE II—EFFECT ON NET INCOME OF THIRD AVENUE RAILWAY HAD THE MAINTENANCE EXPENSES AND THE DEPRECIATION ALLOWANCE EQUALLED 20 PER CENT OF OPERATING REVENUES

	Four Months, Jan. 1 to April 30				Twelve Months to June 30			
	1917	1916	1915	1914	1916	1915	1914	1913
Operating revenue......	$3,334,246.56	$3,503,542.37	$3,376,942.18	$3,236,024.11	$11,136,370.18	$10,885,859.39	$10,858,216.03	$10,117,847.36
20 per cent pursuant to Public Service Commission orders to cover actual maintenance and depreciation.....	$666,849.31	$700,708.47	$675,388.43	$647,204.82	$2,227,274.03	$2,177,171.87	$2,171,643.20	$2,023,569.47
Maintenance and depreciation—per the books:								
Maintenance of way and structures	$318,594.42	$317,119.04	$276,137.83	$410,317.11	$1,090,700.85	$925,973.89	$1,012,646.16	$838,620.95
Maintenance of equipment	253,429.01	201,711.68	222,647.11	230,221.03	599,549.69	678,573.99	713,003.13	614,792.51
Depreciation reserve..	....	....	189,680.94	170,000.00	294,271.00	562,958.80	511,250.00	461,500.00
Total	$572,023.43	$518,830.72	$688,465.88	$810,538.14	$1,984,521.54	$2,167,506.68	$2,236,899.29	$1,914,913.46
Additional charge necessary under Public Service Commission orders	$94,825.88	$181,877.75	*$13,077.45	*$163,333.32	$242,752.49	$9,665.19	*$65,256.09	$108,656.01

*Excess over depreciation charge under commission orders.

are reproduced herewith. Through Table I, for example, and through the testimony of its public accountant, John Flint, of West & Flint, New York, the company showed that in the first four months of 1917 the total operating revenues decreased to $3,334,246 from $3,503,542 for the similar period in 1916. In 1917, however, the total operating expenses (not including depreciation) rose from $2,180,983 to $2,375,835. The net income (not including depreciation) was a surplus of $197,184 in 1916 and a deficit of $149,384 in 1917.

To bring the showing closer to date, the company reported receipts of $884,510 for May, 1917, as compared to $985,032 for this month in 1916, a decrease of $100,522 or $3,242 per day. At the same time the mileage decreased 200,562 car miles or 6470 per day. Of the eleven reporting companies in the system, all but one showed lower receipts. For the period from Friday, June 1, to Tuesday, June 19, 1917, inclusive, as compared with that from Friday, June 2, to Tuesday, June 20, 1916, the receipts decreased from $602,365 to $567,633, or $34,731. The company expects to present full figures up to the latest possible day.

In presenting revenue and expense figures the company disregarded the strike period during the second half of 1916. Consequently the last yearly figures were for the fiscal year ended June 30, 1916. The main subsequent figures were for the first four months of 1917, which could be compared with a part of 1916 not affected by the strike.

THE QUESTION OF DEPRECIATION

The introduction of Table II and Table III by the company met with considerable opposition on the part of city representatives and, on some points, even commission counsel. It appears that on Feb. 3, 1912, the commission ordered the company to set aside each year, before paying adjustment income bond interest or dividends, 20 per cent of its gross operating revenue for "maintenance, depreciation and renewals," the unexpended amount at the end of each year to be credited to a separate depreciation reserve. This order the company has refused to obey to the letter, although from evidence presented at the latest hearing it appears that in effect the commission requirement has been more than met.

As explained by Mr. Flint, the company beginning with the six months ended June 30, 1912, set aside a large sum of cash for depreciation irrespective of maintenance. The amount began at $30,000 a month, the reserve set up for the six months being therefore $180,000. The reserve fund accumulated to $2,009,979 and was invested in company bonds. After Dec. 31, 1915, there were no further additions to the fund. The totals set aside for the respective fiscal years ended June 30 follow: 1913, $461,500; 1914, $511,250; 1915, $562,958, and 1916, $294,271.

In calculating the additional charge that would have had to be made under the commission order, the company has not included in operating revenues intercompany items for rentals. On this basis the 20 per cent charge for maintenance and depreciation under the commission ruling amounted to $9,512,516 for the four and one-half years from Jan. 1, 1912, to June 30, 1916. During this period the company's actual expenditures for maintenance of way and structures and maintenance of equipment totaled $7,173,851. This, combined with the depreciation reserve set up by the company to the abovementioned extent of $2,009,979, gave an aggregate amount of $9,183,831 for actual maintenance expenses and depreciation reserve during the period. This represents a deficiency of $328,685 from the charge to operating expenses arising under the 20 per cent requirement of the commission.

As more than an offset to such a deficiency, however, the company reports charges against surplus during the period to the extent of $339,599 for retirements of property. For the fiscal years ended June 30, these charges were: 1914, $36,340; 1915, $204,497, and 1916, $98,761. These charges, the company states, are equiv-

TABLE III—STATEMENT OF INCOME OF THIRD AVENUE RAILWAY FOR THE PERIOD JAN. 1 TO APRIL 30, 1917 (WITH COMPARISONS OF OTHER YEARS), SHOWING THE AMOUNT OF RETURN

	Four Months' Period, Jan. 1 to April 30			
	1917	1916	1915	1914
Operating income......	$681,816	$1,027,367	$1,047,992	$754,105
Less deficiency in depreciation pursuant to commission rulings	94,825	181,877	*13,077	*163.333
Operating income after allowance of 20 per cent for maintenance and depreciation.....	$586,990	$845,489	$1,061,070	$917,439
Interest revenue:				
Interest on bonds held by system in funds and interest on bank accounts and special deposits	55,549	54,616	26,416	26,844
	$642,539	$900,105	$1,087,487	$944,283
Deductions—rentals, etc.:				
Track and terminal privileges	$4,553	$4,734	$4,813	$4,386
Miscellaneous rent deductions	3,339	4,176	5,564	5,036
Amortization of debt discount	6,148	4,295	972	972
Sinking fund accruals	11,160	10,000	10,000	10,000
Miscellaneous	8,550	7,990	2,932	2,560
Total deductions — rentals, etc.	$33,752	$31,197	$24.282	$22,956
Amount applicable for reserves for contingencies, interest, dividends, surplus, etc.	$608,787	$868,907	$1,063,204	$921,327

*Excess over depreciation charge under commission orders.

alent to appropriations of surplus for the purpose of a depreciation reserve and show that the order of the commission has in effect if not in method been fully carried out. Thus none of the reservation ordered by the commission has been omitted on account of dividends, as was alleged by counsel for the city. By a similar calculation for the five years ended Dec. 31, 1916, the company showed that the deficiency of $259,782 below the 20 per cent operating expense requirement of the commission was more than offset by surplus charges of $390,296 for retirements of property.

Before the above data had been introduced by the railway, the commission allowed Table II to be entered as a hypothetical exhibit. Commission counsel strongly urged, however, that in the precedent finding of fact as to the sufficiency of present rates, only actual expenditures and reservations should be considered, but he said that the whole 20 per cent charge might be used in calculating a fair return for the future. Commissioner Travis H. Whitney asked Mr. Cook whether the company would obey the depreciation order in the future, and whether, if the charge for transfers were granted, it would agree to expend certain portions of the added revenues in ways designated by the commission. Mr. Cook stated that he would be glad to take these points up with the board of directors.

THE VALUATION OF THE PROPERTY

According to Table III, the amount applicable for interest and dividends for the first four months of 1917 was $608,787. After eliminating from this about $40,000 for intercompany bond holdings, the annual rate of return was 3.877 per cent on a physical valuation of $44,000,000. If 6 per cent is a fair return, there is a shortage of $311,312 for the four months' period, and if 8 per cent is fair, a shortage of $604,646.

The valuation figure of $44,000,000 was accepted by commission counsel as hypothetical pending reasonable proof. Its admission was challenged by the city. The figure was used by the company in its table simply because it was the one derived by the commission itself in the 1910 reorganization case of the Third Avenue Railway. After making a detailed appraisal of the physical property on the reproduction-cost basis, the commission then arrived at $35,100,000 as the present value of the property as of Feb. 28, 1910. To this was added $1,746,000 for current assets and $7,200,000 for a cash assessment, giving a total of about $44,000,000.

The city objected even to the use of this figure in calculations on the ground that it was derived in a capitalization case and that it would not meet the requirements in a rate case. Counsel for the company suggested that in 1910 there was no difference noted and that the commission established its figure for the physical value as it would have done in a rate case. The commission finally allowed the old orders dealing with the matter to be entered as evidence, to be considered upon their merits.

Tests to Determine Properties of Iron Alloys

The engineering experiment station of the University of Illinois has just completed another series of experiments to determine the magnetic and allied properties of alloys of iron and other metals. In 1915 experiments with iron-silicon alloys disclosed some remarkable properties which make it superior to any other material for use in certain electromagnetic machinery. These experiments were followed by others dealing with iron-aluminum alloys melted in vacuo, which have shown that aluminum, like silicon, greatly improves the magnetic properties of the metal, and also that aluminum imparts to the metal a greater toughness than silicon. The investigations were conducted by T. D. Yensen and W. A. Gatward. The results are presented in detail in Bulletin No. 95 of the Illinois Engineering Experiment Station, copies of which may be obtained by addressing C. R. Richards, director, Urbana, Ill.

Off-Peak Tank Car Service at Boston

THE advantages of off-peak electric freight traffic on a carload basis are well illustrated by a tank-car haulage service inaugurated in the latter part of 1916 by the Boston Elevated Railway. This service consists of the transportation of molasses from Copps Hill Wharf, Boston, to the plant of the Purity Distilling Company in Cambridge, the product being hauled in tank cars of about 5000-gal. capacity owned by the distilling company and built according to the specifications of the railway company. The traffic is handled between the hours of 8 p. m. and midnight, which are entirely outside the peak-load period of the railway. Either side-dump cars or snowplow motor cars are utilized as electric locomotives in this service without additional investment in rolling stock. The former are used in winter and the latter in summer. The accompanying illustration shows a typical train unit.

INCREASING THE SERVICE FACTOR OF ROLLING STOCK ON THE BOSTON ELEVATED

Molasses is received at Copps Hill Wharf in shiploads, a berthing space 400 ft. long being available. The molasses is pumped from the vessel into a storage tank of 1,500,000-gal. capacity and thence is pumped into the tank cars via a loading tank, the average time of filling per car being about four minutes. A maximum of twelve tank cars have been filled, hauled to East Cambridge and emptied in one night's run, three motor cars being required. The length of haul is about 2 miles from terminal to terminal and about ten minutes are required to empty each car. The motor and tank cars are equipped with air brakes. Two men constitute the locomotive crew on each trip.

The distilling company manufactures pure alcohol for commercial purposes, and before the present service began informed the Public Service Commission of Massachusetts that the former teaming expense practically absorbed all the profits of the business. The teaming charge was 0.3 cent per gallon. The Boston Elevated charge is $9 per loaded tank car one way, or 0.18 cent per gallon. About 12,000,000 gal. of molasses per year are handled. Thirteen trucks were formerly used in the service and a reduction in street congestion, wear and tear has been effected by electric haulage.

Have the New York Commissions Power to Increase Fares?

The Author Answers This Question in the Affirmative and Shows Why

By JAMES L. QUACKENBUSH
General Attorney New York Railways Company

In view of the question which has been raised as to the power of the New York Public Service Commissions to grant an increase in street railway fares, as against the provision in the New York Railroad law (Section 181, passed 1884), fixing a statutory fare of five cents, peculiar interest attaches to the following quotations from a memorandum filed by Mr. Quackenbush with the New York Public Service Commission of the First District. The memorandum is comprehensive, and the quotations are but fragmentary. They are, however, very significant and pertinent to the situation. EDITORS.

THE general authority to adjust the charges to be made by the corporation as compensation for the service, as distinguished from the character of service which it may be required to furnish the traveling public is given by Subdivision 1 of Sec. 49 of the public service commissions law. That section gives the commission complete supervision over "rates, fares or charges, . . . regulations or practices, . . . affecting such rates," in order that it may determine whether they are "unjust, unreasonable, unjustly discriminatory or unduly preferential, or in any wise in violation of any provision of law, or whether the maximum rates, fares or charges . . . are insufficient to yield reasonable compensation for the service rendered and are unjust and unreasonable"; with the further power of determining the "just and reasonable rates, fares and charges to be thereafter observed and in force as the maximum to be charged for the service to be performed."

The standard by which the commission is to be guided in determining the rates and fares to be ordered is, that they shall produce a "reasonable average return upon the value of property actually used in the public service" and enable the corporation to make "reservation out of increase for surplus and contingencies."

The jurisdiction of the commission with respect to rates and charges under this subdivision is sweeping, being held to be virtually "without statutory limitation or restraint."

It will be seen at a glance that the language of this subdivision does not contemplate a mere raising or lowering of rates already established by the common carrier, but clothes the commission with full power to regulate and supervise the entire system of rates and charges and the regulations and practices with respect thereto.

The commission may therefore not only adjust old rates but prescribe new charges for particular kinds of service where no charge was previously made, as well as discontinue charges which, in its judgment, are unjust, unreasonable, unjustly discriminatory or unduly preferential.

In short, the general power to regulate fares resting with the legislature, which is absolute and unlimited except as restrained by the constitution, has been delegated to the Public Service Commission by Sec. 49 of the public service commissions law, together with Sec. 181 of the railroad law, the latter specifically giving to the commission the same power possessed by the legislature to regulate rates of fare "to be exercised as prescribed in the public service commissions law."

Several authorities have held the power of the Public Service Commission to fix rates under Sec. 49 of the public service commissions law or statutes of similar import to be virtually without statutory limitation or restraint.

STATUTORY POWER TO RAISE RATES ALREADY ESTABLISHED

The question was raised as to the authority of the Public Service Commission for the Second District to increase the mileage book rates of the Ulster & Delaware Railroad in excess of the 2 cents per mile, fixed by Sec. 60 of the railroad law. The commission, after investigation, determined that the facts justified the increase but denied the application because of a want of statutory power in the commission to make the order.

The Appellate Division and Court of Appeals held that the commission had the necessary power to make such order, notwithstanding Sec. 60 of the railroad law, which provided that certain railroad corporations should issue mileage books "for which the corporation may charge a sum not to exceed 2 cents per mile." The power of the commission to prescribe maximum fares with respect to mileage books was given by the second paragraph of Sec. 49 of the public service commissions law, which is similar to the first paragraph of that section, heretofore quoted, except that the first paragraph contains the following words, to wit: "Notwithstanding that a higher rate, fare or charge has been heretofore authorized by statute."

The court held that the revision of the public service commissions law and the railroad law in 1910 indicated an intent on the part of the legislature to harmonize the railroad law with the public service commissions law and to make the public service commissions law superior to Sec. 60 of the railroad law in the matter of fixing limitations on rates of fare, and the court therefore reached the conclusion that in order to give full effect to the provision of Sec. 49 of the public service commissions law the commission should determine the reasonable and just rates to be observed as the "maximum."

Sec. 60 of the railroad law should be construed as establishing the maximum rate in the absence of an order by the commission, which body was empowered to fix rates without statutory limitation or restraint. The court said:

"Nothing like these provisions in Secs. 49 and 33 had ever existed before. In all the previous history of the public service commissions law the power of the commission had been confined to reducing rates, or at least to regulating rates within the statutory limitations. The law contemplated simply a reduction of rates by the commission in the interests of the public, and not an increase, even though such increase might be just and reasonable to the carriers.

"The effect of this new legislation was, I think, to make the commission superior to Sec. 60 of the railroad law, fixing limitations on the rates of fare."

In *States ex rel. Missouri Southern R. Co. v. P. S. Comm. of Missouri*, 168 S.W., 1156 (Sup. Ct. of Mo., July 2, 1914), it was held that Sec. 47 of the public utilities act of Missouri, which was borrowed from Sec. 49 of the New York public service commissions law, empowered the Public Service Commission of that State to authorize a common carrier, where the maximum rates prescribed by statute did not produce a reasonable return on the value of the carrier's property, to charge greater rates and fares than the maximum rates so prescribed.

* * *

"All charges" for service of a common carrier and the method and system under which the same shall be collected are therefore under the supervision and regulation of the commission. The nature as well as the amount of rates, fares or charges are to be determined and put in force.

ANALYSIS OF SEC. 49, AS AMENDED IN 1910

It is to be noted also that while, prior to 1910, Sec. 49 seems to have been drawn primarily with a view of protecting the public from unjust charges, the amendments of that year were intended to safeguard the interests of the railroad corporations as well as of the public, no doubt due to the fact that experience had demonstrated that under a system of strict public supervision by the Public Service Commission brought into being in 1907, the mutual welfare of the public and the railroads required that the earnings of the corporation must be reasonably protected in order to insure adequate service to the public.

The amendment of Subdivision 1 giving power to determine maximum rates with due regard to a "reasonable average return" where the old rates are "insufficient to yield reasonable compensation for the service rendered" is manifestly intended to give the commission power to insure to the corporation adequate revenues and save it from possible bankruptcy.

A similar purpose appears in Subdivisions 6 and 7; the former giving power of changing the practices, service, rules and regulations with respect to transfers which may become unreasonable either to the public or to the railroad corporation, and the latter subdivision making the obligation of the railroad company to give free transfers, which was absolute under the former statute (Sec. 104 of the railroad law), dependent upon the action of the Public Service Commission, in pursuance of the public service commissions law. These changes were all made to give the commission plenary power to protect both the traveling public and the railroad corporations.

This view of Subdivision 1 of Sec. 49 giving the commission complete supervision of rates and charges, including not alone the raising and lowering of old rates but the readjustment of rates involving new rates for particular kinds of service and the elimination of old charges where called for, is consistent with the general scope of the entire section. The second paragraph of Subdivision 1 gives the commission power to fix maximum rates for reduced rate tickets and restore old rates previously discontinued.

Subdivision 2 relates to the service to be furnished by common carriers as distinguished from the charges for such service, reposing with the commission full power of determining "proper regulations, practices, equipment, appliances and service" to be observed and used in passenger and freight transportation.

Subdivision 3 gives the commission complete power to establish through routes and joint rates, fares and charges for the through transportation of passengers and property and to apportion the rates, fares and charges for such transportation among the railroad companies affected, thereby putting under the control of the commission the whole matter of inaugurating through routes and devising a new schedule of joint rates, with the further power of fixing the maximum charges and dividing the receipts according to its judgment among the corporations affected.

Subdivision 4 also relates to through transportation of property, empowering the commission to order the construction of new switch connections, declares the terms and conditions under which such service shall be conducted, and provides for the division of receipts and expenses among the corporations engaged in such service.

Subdivision 5 relates to jurisdiction with respect to joint rates and through routes as between the Public Service Commissions of the First and Second Districts respectively.

From this brief review of Sec. 49 of the public service commissions law the purpose stands forth clearly to place under the control of the Public Service Commission (a) all matters pertaining to safe, adequate and proper regulations, practices, equipment, appliances and service to be observed, used and furnished by the common carrier; and (b) equal jurisdiction over rates, fares and charges to be received by the carrier for the service which the commission may require it to give with complete and plenary power of fixing, adjusting and supervising the entire system of charges and schedules of rates.

The fact that the Public Service Commission is given such sweeping power with respect to service and equipment to be required of the railroad companies compels the conclusion that the commission is given a like power with respect to fares, charges and rate schedules. Any other interpretation would place the commission in the unfortunate position of being compelled either to demand the service and equipment which it deems proper, and thereby endanger the financial integrity of the companies affected by reason of its inability to raise and readjust rates to meet the new requirements, or abandon or limit efforts to require satisfactory public service of the railroads, thereby transferring the burden from the companies to the people, permitting the former to exist and causing the latter to suffer, an unsatisfactory condition for all parties concerned.

BROOKLYN GAS CASE NOT CONTROLLING

The recent decision of former Justice Hughes as referee, in *Brooklyn Borough Gas Company v. Public Service Commission, et al.*, holding that the Public Service Commission cannot, in fixing a reasonable rate for gas, exceed the maximum fixed by a valid statute, and denying the motion of the commission to dismiss the complaint, made upon the ground that the public service commissions law affords an adequate remedy, and an application to the commission for an increase in rates was a condition precedent to an application to a court for relief in the form of a suit to enjoin the enforcement of the statutory rate, does not question the power of the Public Service Commission to authorize railroad charges in excess of statutory rates.

Sec. 72 of the public service commissions law, conferring power upon the Public Service Commission to fix the maximum price of gas or electricity "not exceeding that fixed by statute," is held to contain an express restriction upon the power of the commission with respect to the regulation of rates for gas and electricity in the form of the unequivocal language quoted, which was inserted in Sec. 72 by an amendment in 1910, and which does not appear in Sec. 49, relating to railroad rates.

JUSTICE HUGHES SAYS CASES ARE DIFFERENT

The differentiation of the powers of the commission with respect to the two classes of corporations is made in the following language of the opinion:

"Sec. 72 of the public service commission law provides that 'after a hearing and after such an investigation as shall have been made by the commission, or its officers, agents, examiners or inspectors, the commission within lawful limits, may, by order, fix the maximum price of gas or electricity not exceeding that fixed by statute, to be charged by such corporation or person for the service to be furnished.'

"The decision of the Court of Appeals, affirming the decision of the Appellate Division, upon its opinion, in the case of *People ex rel. Ulster & Delaware Railroad Company vs. Public Service Commission*, 171 App. Div., 607; 218 N. Y., 643, is not applicable here, inasmuch as the sections of the public service commission law there under consideration, which related to railroads, did not contain the explicit provision which I have mentioned as being found in Sec. 72 of the public service commission law relating to the powers of the commission in dealing with companies supplying gas and electricity.

"It will be noted that those words 'not exceeding that fixed by statute,' were not in the public service commission law originally. They were inserted by the amendments of 1910. In other words, at the same time when the Legislature amended the public service commission laws with respect to railroads in the manner pointed out by the court in the case above cited, and also amended that law with respect to gas and electric light companies, it inserted in Sec. 72 these words: 'Not exceeding that fixed by statute.'

"It seems to me that these words are very clear and that they cannot be disregarded. * * *

"No construction of the public service commission law with reference to other provisions of the act, either relating to railroads or relating to gas or electric light companies, can be admissible, as it seems to me, which would destroy the effect of this explicit provision which the Legislature has seen fit to incorporate in Sec. 72."

In the Brooklyn Borough Gas case it is also to be noted that the statute fixing the maximum rate for gas there under consideration was enacted by Chap. 604 of the Laws of 1916, thereby making it a more recent statute than Sec. 72 and the other provisions of the public service commissions law under which the Public Service Commission derived its authority to fix rates. In the present proceeding it is to be borne in mind that Sec. 181 of the railroad law, providing for a 5-cent fare on any street surface railroad or branch thereof within the limits of any incorporated city or village, is a re-enactment of Sec. 101 of the former railroad law, which had been in force for many years prior to 1910, when the Public Service Commission by amendment of Sec. 49 of the public service commissions law was given its present extensive powers over railroad rates and charges and, in fact, for many years prior to 1907, when the public service commissions law was originally enacted. Sec. 49 of the public service commissions law must therefore be deemed a later statute than Sec. 181 of the railroad law under the rule prescribed by Sec. 95 of the general construction law, which provides as follows:

"The provisions of a law repealing a prior law, which are substantial re-enactments of provisions of the prior law, shall be construed as a continuation of such provisions of such prior law, modified or amended according to the language employed, and not as new enactments."

Discussion on Coasting Recorders

Among the subjects discussed at a meeting of Stone & Webster operating men at Fort Worth, Tex., on March 28, was that of coasting recorders, which are now used on several Stone & Webster properties and have been ordered for others. It was pointed out that, in addition to energy savings, the coasting recorder had produced other benefits of equivalent value.

Some of those present thought that motormen who were anxious to obtain high coasting records would be liable to operate recklessly, thereby abusing equipment, distorting schedules and increasing accidents. However, others who had had experience with the coasting recorder stated that it had actually cut down the cost of maintaining electrical equipment, saved wheel wear and brakeshoes, promoted closer operation to schedules, more uniform speed and fewer and less serious accidents. The fundamental reason for this improvement lay in the fact that in order to make a high coasting percentage the motorman must be ever alert. This alertness does more than lead him to seize coasting opportunities, since it keeps the motorman on the lookout to make his time points and to avoid accidents. A still further advantage was that a large coasting percentage might be an indication of a slow schedule. In following this up some companies had been able to increase schedule speed, thereby making a saving in the number of cars operated.

Last, and really most important, was the feeling that if the desired advantages are to be obtained it is necessary for the entire organization to understand the principles of coasting, combined with a thorough instruction and follow-up system.

Effect of War in British Columbia

The British Columbia Electric Railway has found that the war has had no appreciable effect upon the company's personnel. Although a large number of men have enlisted, the standard of efficiency has been well maintained in the numerous classes which require skilled labor. Approximately 21 per cent of the company's employees have left the service to join the military or naval forces, or have taken up the manufacture of munitions. Their places have been filled—until they return, or for the duration of the war—by temporary help. The company's records show that the enlistments for military service among the various branches of the company's employees are as follows: Platform men, 19 per cent; shopmen, 13 per cent; electricians, 20 per cent. In connection with the last mentioned it may be noted that this includes substation operators, from which particular class the largest percentage of enlistments occurred, no less than 36 per cent of the company's substation men having joined the colors for service overseas.

New York Committee on Higher Fares Meets

A meeting of the full committee on higher fares of the New York State electric railway companies was held at 8 West Fortieth Street, New York, on the afternoon of June 20. The meeting was devoted to a discussion of ways and means of bringing the need of higher fares before the commissions and people of the State.

COMMUNICATIONS

Steel Trolley Wire on City Lines

MINNEAPOLIS STREET RAILWAY COMPANY

MINNEAPOLIS, MINN., June 14, 1917.

To the Editors:

By way of discussion of the use of steel contact wire, as described in the article by S. H. Anderson, appearing in the issue of the ELECTRIC RAILWAY JOURNAL for June 9, 1917, page 1038, the following points may be of interest:

I believe that the use of steel trolley wire depends greatly upon the service requirements of the line and locality. While its use might prove a success on a system such as the Pacific Electric Railway, with heavy interurban service, I believe that many objections would arise to the use of this material on city streets with heavy single-car local service, particularly where the city requirements demand underground feeder supply and prohibit the use of overhead auxiliary mains. It would seem entirely out of the question to provide trolley taps every 400 ft. from an underground feeder, both on account of the difficulties of providing such taps and also on account of the necessity of greatly extending the underground feeder system.

Our experience shows a much greater wear on the trolley wire at hangers and other attachments even with the most flexible support, and from observation I believe that this extra wear is more a result of flashing and burning than mechanical wear. A remedy for this may be found in the use of a sliding contact in place of the trolley wheel. Some experimenting done along this line indicates that the arcing is greatly reduced by the sliding contact. Also a sliding contact may be operated with much less pressure on the wire than with the rolling contact, which fact tends to lessen the damage of crystallization by the pounding of the trolley.

If this extra wear on copper trolley wire at point of attachments could be eliminated by use of a sliding contact, the arguments for using steel trolley wire would be greatly reduced. E. H. SCOFIELD,
Engineer of Power and Equipment.

BOARD OF SUPERVISING ENGINEERS
CHICAGO TRACTION

CHICAGO, ILL., June 19, 1917.

To the Editors:

I have read the article by S. H. Anderson in the issue of June 9 concerning the use of steel trolley wire by the Pacific Electric Railway. In general this article does not cover the use of steel wire for city service, and while I have very little doubt as to its utility for interurban service or for steam railroad electrification, I am not enthusiastic concerning its use for city service, although I have had no personal experience with it. I think we might expect pitting of the wire at accelerating points, and I believe that this difficulty, which is in existence with ordinary trolley wire, will be increased when the contact is between dissimilar metals, such as steel wire and the composition trolley wheel.

In heavy city service practically all points on the line are accelerating points, as the regular service stops are so numerous and other emergency or necessary stops practically make the entire line subject to much pitting action. Furthermore, on city lines it is difficult to keep the pressure of the trolley wheel on the wire at a constant value, due to fluctuating heights of wire on account of subways under railroad elevations, grade crossings and bridges. The lower conductivity of the steel wire makes further feed-in points necessary. Such points are numerous enough at present and the addition of more such points would add to the expense and the difficulty of maintenance.

The article in question indicates the use of such wire chiefly for catenary construction, and for such purpose I believe it would be highly satisfactory.

For the reasons stated, I believe that the utility of the use of steel trolley for direct suspension work in city service is open to question. RALPH H. RICE,
Principal Assistant Engineer.

A Day's Labor in Four Tons of Coal

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

WASHINGTON, D. C., June 18, 1917.

To the Editors:

I am very glad to learn of the efforts which you are exerting to persuade the electric railways to attain all practicable economy in the use of fuel. If the users of coal can be brought to realize that every 4 tons of coal has required a day's work of one man in the mining industry and has utilized a proportional amount of the energy of the railroads, I believe that much will have been accomplished for the efficiency of the nation in this crisis. PHILIP S. SMITH, Acting Director.

AMERICAN ASSOCIATION NEWS

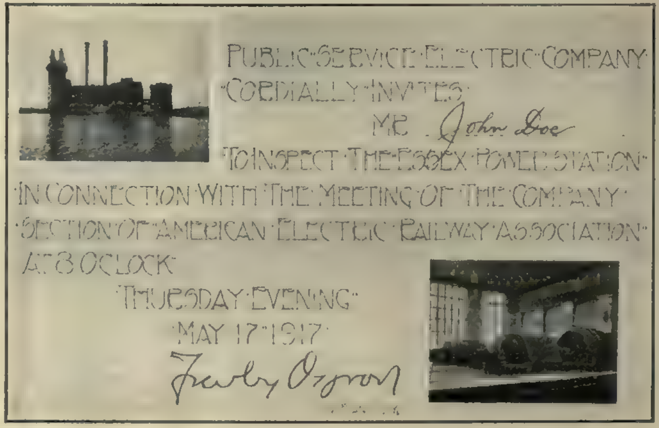
Coming Committee Meetings

A meeting of the executive committee of the American Association will be held at the association office in New York on June 26 and 27. At that time it is expected that all matters connected with the meeting in the fall will be settled.

On Wednesday, June 27, there will be a meeting of the executive committee of the Engineering Association.

Public Service Section

In connection with the inspection of the Essex power station of the Public Service Electric Company, described in the issues of this paper for May 26, page 962, and June 9, page 1040, the Electric Company sent out the invitation reproduced above. It was handsomely printed on large cards well worthy of framing.



PUBLIC·SERVICE·ELECTRIC·COMPANY
·CORDIALLY·INVITES·
MR. John Doe
·TO·INSPECT·THE·ESSEX·POWER·STATION·
·IN·CONNECTION·WITH·THE·MEETING·OF·THE·COMPANY·
·SECTION·OF·AMERICAN·ELECTRIC·RAILWAY·ASSOCIATION·
AT·8·O'CLOCK·
·THURSDAY·EVENING·
·MAY·17·1917·

INVITATION TO POWER PLANT INSPECTION

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Track and Paving Construction in Seattle, Wash.

BY S. E. GOODWIN
Senior Inspector, Department of Public Utilities

In Seattle there are in general use but two types of pavement, brick and asphalt, on permanently improved street railway rights-of-way. The railway companies are obligated to improve their rights-of-way with the same pavement as is used by the city on each side of the tracks. In practically all streets on which traffic is light and the grade easy, asphalt has been used because of its smoothness, its cheapness and the short time required to harden after having been laid. Brick pavement has, however, proved most satisfactory in Seattle, complying, as it does, with the three essentials, smoothness, good wearing qualities and ability to withstand rail vibrations. A most important factor in a good brick surface is, of course, the quality of the brick itself. In this respect Seattle is fortunate in having within its limits a manufacturer of a particularly excellent paving brick.

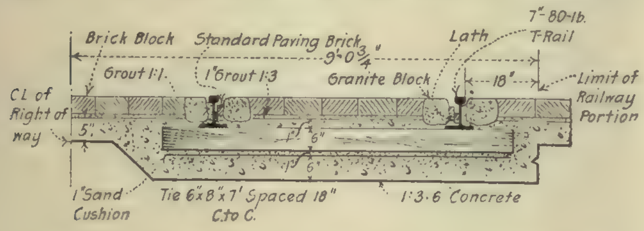


FIG. 1—COMBINATION PAVING, USING BRICK AND GRANITE BLOCK

Granite block pavement has been used on some streets of heavy grade and has given good satisfaction. None of this type has been installed during the last six years, however, although the Puget Sound Traction, Light & Power Company has in a number of cases employed granite block in combination with brick or asphalt as shown in cross-sections Figs. 1 and 2. The advantage of this type of construction is that the portion subjected to the greatest amount of wear and rail vibration is best adapted to withstand destructive forces.

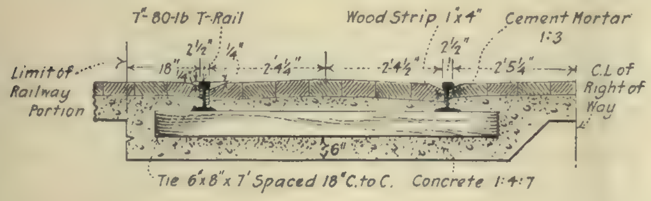


FIG. 3—WOOD-BLOCK WITHOUT SAND CUSHION

Wood-block pavement, though still in the experimental stage in Seattle, will in all probability be used to a much greater extent in the coming years as it has met with general approval. It is noiseless, sanitary, durable, easily repaired and can be laid by the railway company's own construction force. The local standard for wood-block paving is shown in Fig. 3. It will be noticed that no sand cushion is provided under the blocks. The top of the concrete is smoothed with a ¾-in. layer of 1:2 cement mortar which, after setting, is painted with hot asphaltum and the wood blocks are laid immediately thereon.

The cross-section in Fig. 4 is of the type of pavement used on Second Avenue after the track reconstruction. The tracks on this street were originally laid in 1895 with high 72-lb. T-rails and brick paving. As this is one of the most heavily traveled streets in the city it was requisite to provide as good a type of pavement construction as possible. In the reconstructed track the rails are of grooved type, 116 lb. per yard and 7 in. in height, this type being in use on only one other line in the city, the Municipal Railway. The rails are supported on creosoted fir ties and special combination tie plates, with rail braces at every fifth tie. On account of the shape of the rail the center of bearing does not fall in line with the center of gravity, and were it not for the braces there would be a pronounced tendency for the rail to tip outwards. Screw spikes are used to fasten the rails to the three ties on each side of each joint, ordinary spikes holding the intermediate ties. The joints are of the continuous type except in the west track between University and Seneca Streets, where Wightman joints are used.

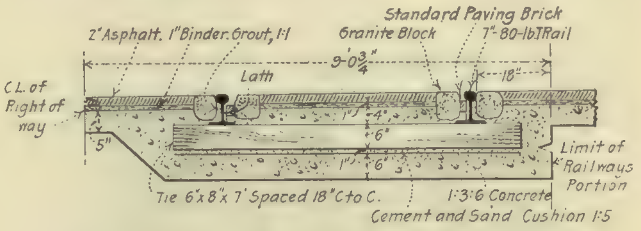

Standard Paving Brick
2" Asphalt. 1" Binder. Grout, 1:1
Granite Block
7"-80-lb T Rail
9'-0¾"
Lath
18"
C.L. of Right of way
1"
4"
6"
5"
1"
6"
Limit of Railways Portion
Tie 6"x8"x7' Spaced 18" C to C.
1:3:6 Concrete
Cement and Sand Cushion 1:5

FIG. 2—COMBINATION PAVING, USING ASPHALT AND GRANITE BLOCK

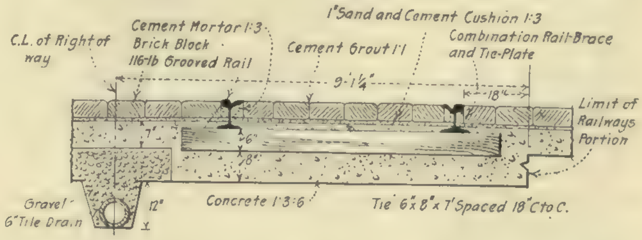


FIG. 4—TRACK CONSTRUCTION ON HEAVILY-TRAVELED BUSINESS STREET

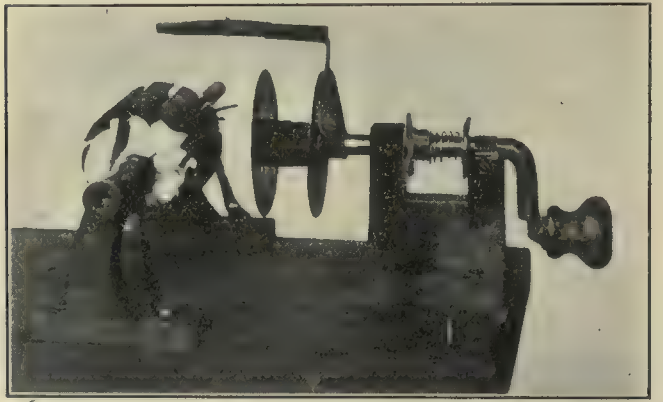
Under the center of each track and under each rail are twisted reinforcement rods embedded in the 8-in. concrete base. A ⅜-in. x 2-in. flat tie rod is placed on each side of the track joints. The concrete is proportioned 1:3:6 and the type of mixer used allows it to be poured directly into place. Under the center of the right-of-way is a 6-in. tile drain laid with open joints and embedded in gravel.

These tracks were reconstructed by the Stone & Webster Engineering Corporation and the work was so executed as to cause minimum impedance to the progress of the contractor paving the city's portion.

Winding Heater Motor Armatures

The armature winder in the Des Moines City Railway shops has built a crude but effective machine for winding the armatures of the small heater fan motors. A small bobbin for the wire is placed on a crankshaft, as seen in the photograph herewith, which is set on a block at right angles to the armature being wound. The wire feeds from this bobbin up onto an arm projecting over the armature and off this arm in line with the proper slot in the armature.

As the crank is turned and the arm approaches the armature shaft, a small cam mounted on the crank block pulls the crankshaft back so that the winding arm will pass by the armature shaft and then a small coil spring forces the arm back in line with the opposite slot of the armature, and so on. This cam is simply a washer with a hump bent into one side and fastened to the wooden block as shown. A steel bushing fastened to the shaft is held against this washer by a spring, and when it strikes the hump it is forced back and carries the shaft with it. Proper tension is given the wire by a small flat steel spring on top of the winding arm which presses the wire against the bottom of the arm as it is fed through. By the use of this ingenious device the winder has only to turn the crank and count the number of turns.


HOME-MADE DEVICE FOR WINDING HEATER MOTOR ARMATURES

Simplified System for Stockroom Storekeeping

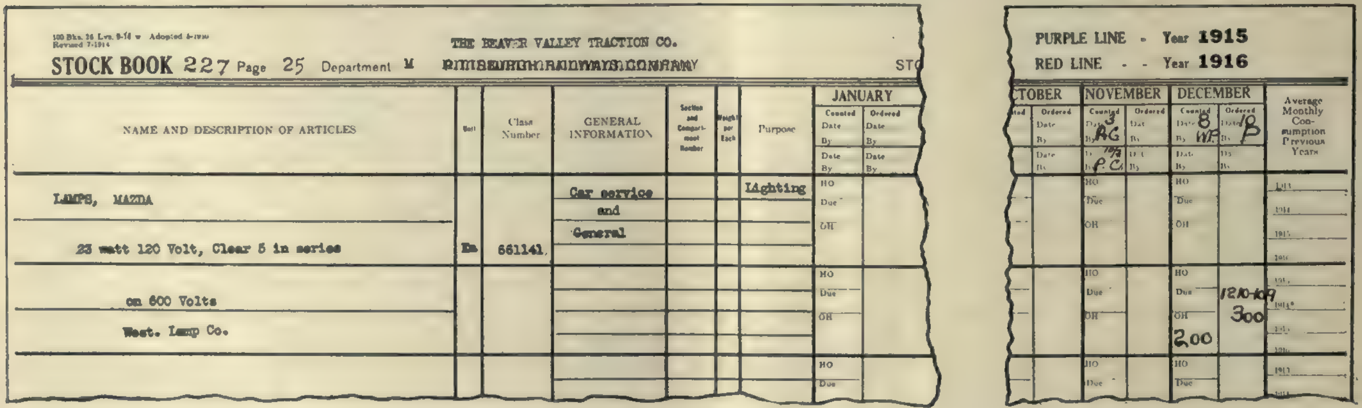
Storekeeping Methods Maintained by the Beaver Valley Traction Company of New Brighton, Pa., Are Efficient and Complete

BY W. D. PIERI
Storekeeper for the Beaver Valley Traction Company

Our stock book, in which every item of material in stock is listed, is the most important record of the stores department, and I might say that it is of the same form as shown in an article which appeared in the March 17 issue of the ELECTRIC RAILWAY JOURNAL. It shows the exact location of the bins or compartments in which the material is located, the amount of material on hand, the quantity on order, and the purchasing requisition number of all items ordered. It also gives an exact description of each item, giving the class or lot number, the exact movement of all stock items from month to month, and from this record an average monthly consumption is easily determined. The terms HO, Due, and OH, found under each monthly column, indicate respectively quantity for which orders are being held, quantity due on previous requisitions or shop orders, and quantity on hand. The books are thus kept up to date and will show any obsolete or surplus material which may be on hand.

Once a month stock is taken and, in order to ascertain the quantity still due on uncompleted orders, the stock books are checked for all back orders that have been received. Material is then ordered based on the monthly consumption, and any new construction work to be provided for.

To illustrate the system to the best advantage to the reader, we shall trace an item from the time it is ordered until it is put into use, showing the various forms used in the stores department. In going over the stock books (Fig. 1) it is seen that we are in need of some 23-watt Mazda lamps. A purchasing order material requisition blank (Fig. 2), is made out in duplicate, showing the quantity on hand, quantity due and quantity wanted; and also a description of the material, lot number and purpose for which it is to be used. After being approved, the original copy is forwarded to the purchasing agent, the duplicate filed, and the requisition number and quantity ordered are posted in the stock books (Fig. 1). The purchasing agent returns a storekeeper's memorandum (Fig. 3), which is an exact copy of the material requisition, and also gives the order number, date and firm from which the material was ordered. The memorandum is checked with the duplicate material requisition, and the date, order number and firm's name are posted on the duplicate requisition, which is on file. This helps to check any duplica-


100 Bks. 26 Lvs. 9-14 Adopted
Revised 7-1914

THE BEAVER VALLEY TRACTION CO.
STOCK BOOK 227 Page 25 Department M PITTSBURGH RAILWAYS COMPANY

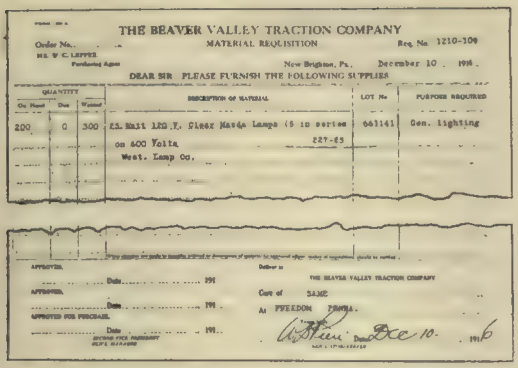
NAME AND DESCRIPTION OF ARTICLES	Unit	Class Number	GENERAL INFORMATION	Section and Compartment Number	Weight per Each	Purpose
LAMPS, MAZDA			Car service and General			Lighting
23 watt 120 Volt, Clear 5 in series	Ea.	661141				
on 600 Volts						
West. Lamp Co.						

JANUARY: Counted Date By, Date By; Ordered Date By, Date By; HO, Due, OH

PURPLE LINE - Year 1915
RED LINE - - Year 1916

NOVEMBER Counted	NOVEMBER Ordered	DECEMBER Counted	DECEMBER Ordered	Average Monthly Consumption Previous Years
Date 3 By AG	Date By	Date 8 By WP	Date 18 By P	
Date 10/7 By P.C.	Date By	Date By	Date By	
HO Due OH		HO Due OH		1913 1914 1915 1916
HO Due OH		HO Due OH 200	1210-109 300	1913 1914 1915 1916
HO Due		HO Due		1913 1914

STORE KEEPING—FIG. 1—STOCK BOOK PAGE, SHOWING MONTHLY RECORD OF NEW, OLD AND SCRAP MATERIAL

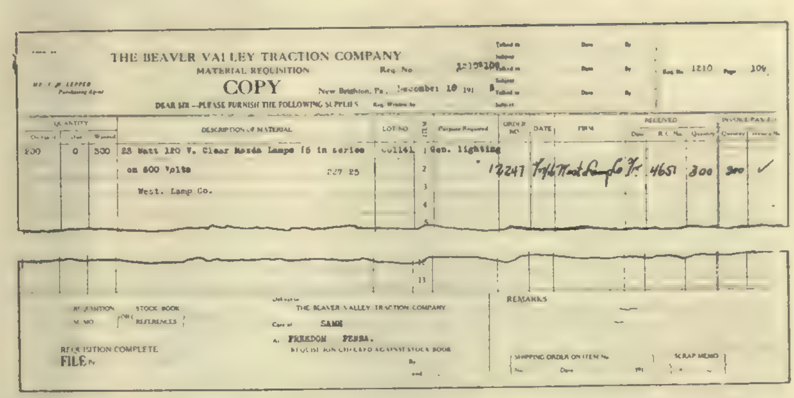


THE BEAVER VALLEY TRACTION COMPANY
MATERIAL REQUISITION
Order No.
Req. No. 1210-109
MR. W. C. LEPPER
Purchasing Agent
New Brighton, Pa., December 10, 1916.
DEAR SIR PLEASE FURNISH THE FOLLOWING SUPPLIES

QUANTITY			DESCRIPTION OF MATERIAL	LOT No.	PURPOSE REQUIRED
On Hand	Due	Wanted			
200	0	300	23 Watt 120 V. Clear Mazda Lamps (5 in series on 600 Volts 227-65 West. Lamp Co.	661141	Gen. lighting

APPROVED
Date 191
APPROVED
Date 191
APPROVED FOR PURCHASE
Date 191

Deliver to
THE BEAVER VALLEY TRACTION COMPANY
Care of SAME
At FREEDOM PENNA.
Date Dec 10 1916



THE BEAVER VALLEY TRACTION COMPANY
MATERIAL REQUISITION
COPY
Req. No. 1210-109
MR. W. C. LEPPER
Purchasing Agent
New Brighton, Pa., December 10 1916
DEAR SIR—PLEASE FURNISH THE FOLLOWING SUPPLIES
Req. No. 1210 Page 109

QUANTITY			DESCRIPTION OF MATERIAL	LOT NO.		Purpose Required	ORDER NO.	DATE	FIRM	RECEIVED			INVOICE PASSED	
On Hand	Due	Wanted								Date	R. C. No.	Quantity	Quantity	Invoice No.
200	0	300	23 Watt 120 V. Clear Mazda Lamps (5 in series	661141	1	Gen. lighting								
			on 600 Volts 227 25		2		12247	2/15	West. Lamp Co.	2/15	4651	300	300	✓
			West. Lamp Co.		3									
					4									

REQUISITION STOCK BOOK
REFERENCES
REQUISITION COMPLETE
FILE
Deliver to
THE BEAVER VALLEY TRACTION COMPANY
Care of SAME
At FREEDOM PENNA.
REQUISITION CHECKED AGAINST STOCK BOOK
By
REMARKS
SHIPPING ORDER ON ITEM No.
No. Date 191
SCRAP MEMO

STORE KEEPING—FIG. 2—MATERIALS REQUISITION BLANK. FIG. 3—STOREKEEPER'S MEMORANDUM BLANK

tion of the order, and checks any error that might be made in the purchasing department.

When the material arrives at the storeroom it is checked by the receiving clerk, and a receiving card (Fig. 4) is made out in duplicate, showing the firm, date received, order and requisition numbers, quantity description of material, lot or class number, how received, and condition of material when received. The receiving card number, date and quantity received are shown in their proper places on the duplicate copy of the material requisition blank on file. This enables the storekeeper to check at once any duplicate shipment on this order. The duplicate copy of the receiving card is filed. After checking the material received with its requisition blank, a description tag (Fig. 5) is made out showing receiving card number, class number, date received, quantity, order number, requisition number, firm purchased from, and a description of the material. The material is then put away in its proper bin or compartment. The receiving card is posted in the ledger under the class number and the material shown is ready to be requisitioned out.

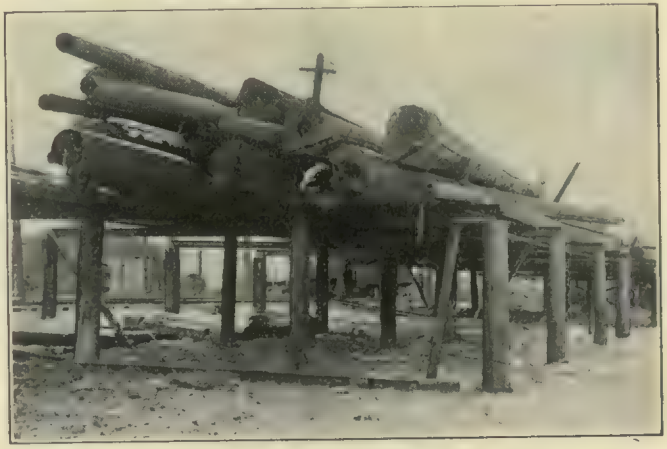
Material is given out of the storeroom on requisition only. Requisition books, having requisitions (Fig. 6) in duplicate, serially numbered, are furnished the foremen and heads of departments and all requisitions must be accounted for. They show the purpose for which the material is to be used, the quantity wanted, description of material, and the lot number and account to which it is to be charged, being placed thereon by the stores department. They also show to whom the material was given. This requisition is then forwarded to the auditing department for posting.

We require that all invoices for material purchased be furnished in triplicate. After the material has been received, and the invoice checked and approved for payment, the original and duplicate copies are forwarded to the auditing department. The triplicate copy is stamped by the storekeeper, and the blanks (Fig. 7) filled in to show the date material was received, receiving card number, checked "O. K." for payment, and the date on which the invoice was passed for payment. This triplicate copy of the invoice is filed in the storeroom, thus saving the expense and trouble of keeping a card file and index of the above information.

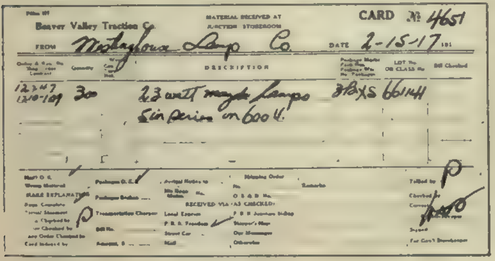
The system as described enables the company to have a record on hand at all times of the full transaction for all material purchased and received.

Storing Poles for Easy Loading

The Western Ohio Railway has built a pole storage at Wapakoneta, Ohio, adjacent to its right-of-way, which greatly facilitates the loading and unloading of poles from and into storage. This arrangement consists of a number of piles driven into the ground, with old girder rail laid across the top of them to form a support on which the poles can be rolled. This places the poles on about the same level above the ground as the flat cars used in hauling them. It is therefore a very simple matter to lay short pieces of rail from the piles nearest the track across to the car floor and roll the poles from the storage structure to the car. Also, by storing the poles in this elevated position they are kept up out of the moisture from the ground and the free circulation of air around them retards rotting.



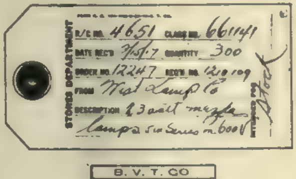
POLE STORAGE STRUCTURE ON AN OHIO ELECTRIC LINE



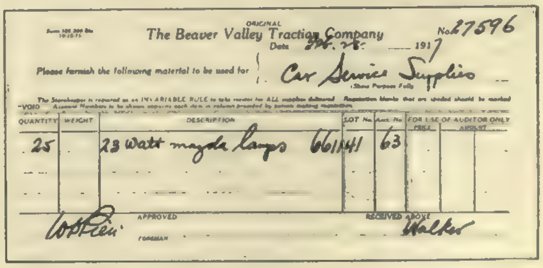
Beaver Valley Traction Co.
MATERIAL RECEIVED AT JUNCTION STOREROOM
CARD № 4651
FROM Westinghouse Lamp Co. DATE 2-15-17

Order & Req. No.	Quantity		DESCRIPTION		LOT No. OR CLASS No.	Bill Checked
12247 1210-109	300		23 watt mazda lamps 5 in series on 600 V.	3 Bxs	661141	

RECEIVED VIA (AS CHECKED)
Local Express
P. R. R. Freedom
Street Car
Mail
Shipping Order
No.
Remarks
Tallied by
Checked by
Signed
For Gen'l Storekeeper



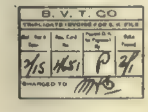
STORES DEPARTMENT
R/C No. 4651 CLASS No. 661141
DATE REC'D 2/15/17 QUANTITY 300
ORDER No. 12247 REQ'N No. 1210-109
FROM West Lamp Co
DESCRIPTION 23 watt mazda lamps 5 in Series on 600 V



ORIGINAL
The Beaver Valley Traction Company
No. 27596
Date 1917
Please furnish the following material to be used for Car Service Supplies
(Show Purpose Fully)

QUANTITY	WEIGHT	DESCRIPTION	LOT No.	Acct. No.	FOR USE OF AUDITOR ONLY	
					PRICE	AMOUNT
25		23 Watt mazda lamps	661141	63		

APPROVED
FOREMAN
RECEIVED ABOVE Walker



B. V. T. CO
TRIPLICATE INVOICE FOR S. K. FILE

2/15	4651	P	2/1

CHARGED TO

STORE KEEPING—FIG. 4—RECEIVING BLANK. FIG. 5—DESCRIPTION TAG. FIG. 6—REQUISITION BLANK. FIG. 7—INVOICE STAMP

Locomotive Cranes of Pacific Electric Railway

The Author Describes the Crane Equipment Used by This Company and the Work That Is Done with It

BY CLIFFORD A. ELLIOTT
Cost Engineer Pacific Electric Railway, Los Angeles, Cal.

The first electric crane purchased by the Pacific Electric Railway was placed in service in January, 1913. It was a 60-ton wrecking crane built by the Industrial Works of Bay City, Mich., and it has given valuable service in rerailing box cars and freight motors in several minor freight train wrecks. This crane has also served advantageously and economically in setting steel bridge girders, placing riprap rock at bridge approaches and along banks of streams for flood control, and setting railroad crossings and other heavy special-work layouts in place, as well as in the material store yards in loading and unloading rail and various classes of heavy material. The boom can be operated through a complete circle, whereby "bad-order" carloads of rail received at the yards are often transferred with dispatch by swinging the rail from the "bad-order" car to another car placed immediately in the rear of the crane on the same track. Sorting of a car of miscellaneous track material has also been accomplished by the same method. Recently the company erected with its own forces one of three proposed divisional carhouses and store track layouts. The timber trusses, bays and framework were erected in form on the ground and then placed in final position with the crane, this economical manner of handling the work effecting a great saving.

SHOP-BUILT CRANE USED BY MAINTENANCE-OF-WAY DEPARTMENT

PACIFIC ELECTRIC WRECKING CRANE PLACING BRIDGE GIRDER

In consequence of the successful operations of this first crane equipment, it was deemed expedient during the year 1915 to place in service a lighter capacity crane for doing rapid work in the various municipalities on the Pacific Electric Lines where traffic congestion, restrictive ordinances and undesirable conditions made it impractical to operate the larger crane. An obsolete 60-ton Vulcan steam shovel, with its swinging gear and hoist but without its steam propelling equipment, was rebuilt for the purpose, the boilers being removed and electric driving motors installed. This shop-built crane is of 5 tons capacity. The boom has a 30-ft. radius, and a vertical rise of 25 ft. is obtainable without obstruction of the trolley, or 18-ft. when the trolley interferes. An idler car is always included as part of the crane equipment, as is also a full set of track tools. Six 600-lb. scrap car wheels are carried on the back of the car as a counter weight. The total gross weight of the crane and equipment is 91,000 lb., and because the operating motor is set well back in car the balance is well maintained.

Since this crane was placed in service, a second rebuilt equipment of similar type has been provided for the exclusive use of the store department at the company's material yards, thus permitting the first shop-built crane to remain constantly in the maintenance of way department. This has resulted in more efficient work and elimination of interference to the department's maintenance programs, which have suffered through loaning the crane at times for the store department's work. The crane in the service of the store department is of only 3 tons capacity because it has a 36-ft. boom and a limited counterbalance. The extra length of boom required by the store department is for handling long steel and wooden trolley poles, rail of 50-ft. and 60-ft. lengths, and miscellaneous other material.

The Pacific Electric is constantly devising original methods of handling various classes of work for the cranes, whereby the cost of the work may be reduced to the minimum, and the element of dispatch in so handling the work is of the highest order. When this company recently constructed its new overhead viaduct in the rear of its Main Street terminal, two tracks existed on a portion of the old viaduct which could not be taken out of service while rearranging special work of the new layout. With the cranes the new special work was installed and old layouts were relocated while traffic was stopped, within a minimum time and with very little delay to train operation. In addition all track material for new tracks on the viaduct was unloaded with much rapidity.

The maintenance of way department maintains several branch material assembly yards at various points on the lines. At the most centrally-located yard a large stationary electric motor-driven rail bender is operated, designed particularly for curving the tee and girder sections of rail used in city paved streets. The rail is shipped to this yard and the crane unloads each rail separately. Then when it is curved by the rail bender, the rail is returned by the same operation to the same car or another car for shipment to the various jobs. Thus there is a considerable saving in time, labor and handling cost.

Recently the company performed a large job of grading for removal of a bluff to provide ground for one of its new divisional carhouses. After graders and steam shovel crews had left the work, the crane was used in leveling down the slope. A wooden slip was attached by a chain, and the boom of the crane adjusted so as to drag the slip over the graded area, thus performing cheaply a task that would have been difficult and tedious if attempted by manual effort.

The way department crane has been found of great aid in reconstruction work on single-track lines, where service is frequent and it is undesirable to detour traffic. After the 50-ft. lengths of rail are distributed with the crane alongside the track, a regular rail fork is attached to each rail in the center and the track men attach one pair of continuous joints, inserting only one bolt to secure it temporarily. Then the crane lifts the rail, setting it in place on spaced ties, while twenty track laborers immediately spike the rail and bolt the joints. The entire transaction consumes five minutes for each rail length handled. Since the length of crane boom is 30 ft., the 50-ft. rail lengths are conveniently handled.

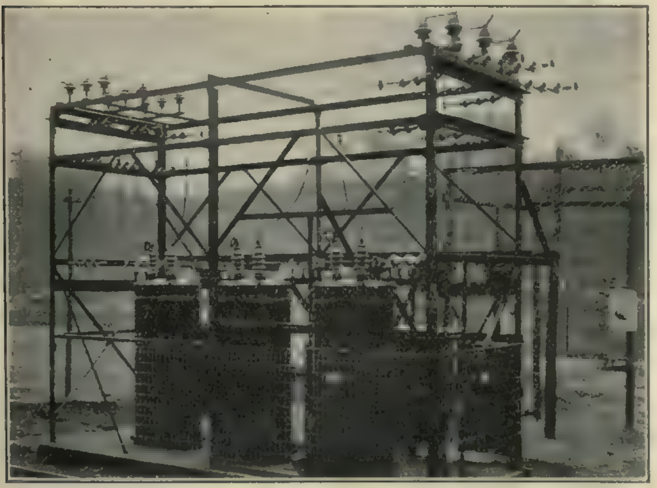
When the company's bridge and building department completes reconstruction of pile trestles, the crane serves in following the work and picking up scrap bridge timbers and piling, and gives the same service in unloading new material for the repair work of this nature. During the heavy spring rains each year there have been several seasons when severe floods occurred and considerable damage was done. In such cases the crane gives excellent emergency service in quickly reaching the various bridges on the lines and it is utilized in placing boulders to obstruct the flood waters from overflowing streams, thus preventing the waters changing their course and seriously damaging the tracks or disrupting operations of the lines. At the same time the crane is used in removing large obstructions that may have been washed up against bridges and are likely to cause extensive damage unless removed at once.

On the double-track construction of the Pacific Electric crossovers are frequently relocated from ¼ mile to 1 mile or more farther up or down the line. The expense of relocating these facilities has been lessened one-half, as compared with former practice, and the quickness of making such changes minimize delays to traffic.

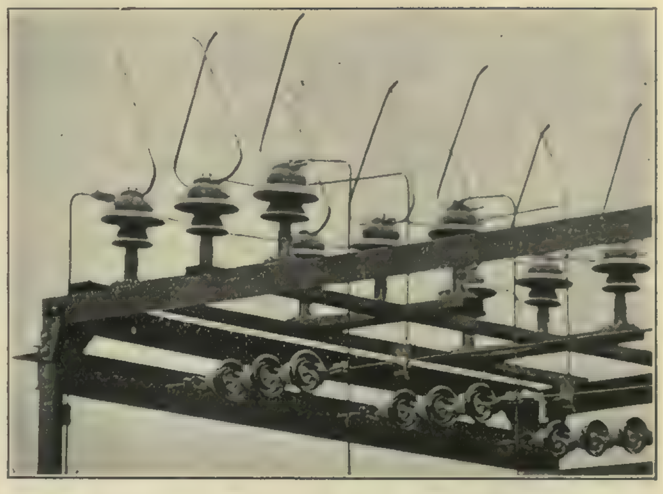
Georgia Railway & Power Company's Home-Made Outdoor Substations

About five years ago the Georgia Railway & Power Company began the installation of outdoor substations of its own design, using horn-gap lightning arresters, switches, and similar apparatus of its own special design and manufacture.

The accompanying illustration shows a substation at Cartersville, Ga., which is typical of the substations being built by the company. This is a three-phase, 60-cycle station with three General Electric 38,000/2300-volt transformers. The insulator pins are made of paraffined locust, which is the company's standard, and they are securely held in place by means of a split casting which firmly clamps the lower part to the pin. Care is taken to anchor the lines directly to the framing so that the side strain on the pins does not exceed 600 lb. The insulator cap and pin are removable, so that by making proper jumper connections insulators can be replaced without opening the circuit. Also, unlike standard apparatus, the transformer taps can be changed to raise and lower the voltage without shutting down the station.



OUTDOOR SUBSTATION WITH HOME-MADE CONSTRUCTION



HOME-MADE INSULATOR PINS AND HORN GAPS

During 1916 the company built substations of the kind described above at the rate of about one a week.

Operating Rotaries Without Compounding on a 1200-Volt Heavy Railway

BY E. R. CUNNINGHAM

Electric Superintendent Oregon Electric Railway, Portland, Ore.

Contrary to usual interurban practice, we operate our rotary converters as shunt-wound rotaries, without any compounding. We find this method of operation desirable for several reasons. Our system is quite different from the ordinary interurban railway as it is not operated in accordance with interurban practice, but just like a steam railroad, and by steam railroad officials. Thus, cars are never run singly on our lines, but in trains of from two to ten cars each, the average train consisting of about three 50-ton cars, with five to seven-car trains very common. About the only difference between our method of operation and that of a steam line is that since we use electricity, power can be applied to from 50 per cent to 75 per cent of the axles in the train, making the acceleration much faster than with either a steam or electric locomotive.

Five of the eight substations, which furnish power to about 175 miles of main-line track, have but one 500-kw. rotary each. The excessive swings on these stations incident to the rapid acceleration of a heavy train near the station makes it very desirable to operate the rotaries with a drooping characteristic. In our case this could best be obtained by cutting out the compound windings altogether and operating the converters shunt wound. Inasmuch as there are never more than two or three trains pulling on any one substation at a time, and usually but one train, we do not find it any disadvantage to allow the voltage to drop slightly at the substation when heavy trains are starting near it. On the contrary, we find that it is a great advantage for the reason that when a train is starting, it is necessary either to cut down the voltage by means of grid resistors carried on the train, or to allow it to drop at the substation. There seems to be no good reason for carrying a large amount of grid resistors on the train to reduce the voltage at the same time that it is being raised at the substation by means of compound winding, if such windings are used.

Moreover, by allowing the voltage to drop slightly at the near station, the two adjacent substations are enabled to help by picking up a part of the load. With the compound windings cut in on rotary converters or on motor-generator sets under like conditions, the substation which is overloaded tends to boost the voltage. Not only will it then carry all the load on the line, but it will actually tend to pick up the adjacent stations and motor them unless knocked off the line by the overload—which is usually the case. We considered it far better, and results have demonstrated that we were right, to allow the voltage to drop at the station where the overload occurs, so that the station will stay on the line and deliver its full rated capacity at a reduced voltage, instead of going off the line entirely and not carrying any part of the load. Since cutting out the compound windings, flashovers have been eliminated almost entirely. The effects of a flashover, when one does occur, is greatly minimized, for the reason that the field excitation drops as a result of the short-circuit. Furthermore, the flashover is not nearly as vicious or destructive as it would be if the excitation was held up by the series winding, which would be the case if it were cut in.

We have also grounded the frame of our rotaries through a limiting resistance to minimize the destructive effect of flashovers. Before these changes were made, we found that the flashovers on our 1200-volt rotaries were most destructive.

How to Burn Anthracite Buckwheat Instead of Bituminous Coal in a Small Railway Plant

In a recent investigation of the power plant of the Concord, Maynard & Hudson Street Railway at Maynard, Mass., Prof. Edward F. Miller of the Massachusetts Institute of Technology outlined the methods to be followed in burning buckwheat instead of soft coal in the boiler installation. The boilers are of the Aultman-Taylor type, each having about 56 sq. ft. of grate surface and a rating of about 230 hp. Experience at the old power plant of the Institute in Boston indicated a large saving by burning buckwheat at times of moderate load. Professor Miller pointed out that in order to burn buckwheat at the Maynard plant it would be necessary to reduce the area of the openings through the grate and to provide a forced draft to furnish air under pressure to the ash pit.

This draft should be varied according to the depth of the fire and should be so regulated that the pressure over the fire is just about atmospheric. There would be no difficulty in burning 20 lb. of coal per square foot of grate area per hour, and a maximum of 28 lb. could be attained. At this higher rate of combustion there would be required 1 in. or 1¼ in. of air pressure on the discharge side of the blower. The evaporation of water per pound of buckwheat coal is about 8 lb., and from 2 to 2½ per cent of the steam would be taken by the fan engine. In winter this steam could be exhausted into the heating system.

Each boiler burning about 20 lb. of coal per square foot of grate per hour and evaporating about 8 lb. of water per pound of coal would develop about 299 hp. The amount of air required for the two boilers when each is developing 299 hp. would be about 10,200 cu. ft. per minute, and a 5-hp. engine would be required for the fan. The discharge from the fan would be brought down through the side of the setting into the ash pit with a damper in the discharge pipe close to the boiler. It is necessary, Professor Miller pointed out, for the fan engine to have a steam valve between the governor and the boiler controlled by a damper regulator operated by the boiler pressure. A ¼-in. by-pass around the throttle makes it possible to keep the fan engine turning slowly, even though the damper regulator may have cut off the main steam supply to the engine. This prevents the stalling of the engine on the center.

Steam is supplied from the boilers to the heating system in the carhouse. About 5000 ft. of 1¼-in. pipe are installed and the estimated heating surface is 2170 sq. ft. of radiation. It is assumed that ½ lb. of steam per hour is condensed per square foot of heating surface, or 1185 lb. per hour, including a small building with 200 sq. ft. of radiating surface. Were this 1185 lb. of condensate to be returned to the boiler room at a temperature of 200 deg. there would be a saving of 140 B.t.u. per pound of water if the feed water taken in from the outside were at 60 deg. It was estimated that this return of condensate would save 432 lb. of coal per day of twenty-four hours, and the heating season of 128 days would enable a total saving of 55,296 lb.

Flexible Joint Remedies Turnbuckle Brake-Rod Failures

The Elmira Water, Light & Railroad Company has had considerable trouble due to the breaking of the turnbuckle brake rods on Standard O-45 maximum traction trucks. This rod is a rigid member carrying a turnbuckle, and failure was due to the compressive forces which were sometimes applied eccentrically so that they tended to bend the rods.

This was remedied by making a turnbuckle brake rod with a joint, the latter having sufficient play in it to avoid the bending action. One of these rods is shown in the accompanying illustration. To make the joint, a socket 4½-in. long and 1¼-in. in diameter was drilled in the threaded section. The rod that fits therein is 1 in. in diameter so that there is ¼-in. play, which is enough to take up the bending action. The two parts are held together by a loose-fitting bolt.

TURNBUCKLE BRAKE ROD WITH FLEXIBLE JOINT

On the United Railroads of San Francisco, Cal., it is customary to give the air-brake reservoir a thorough test at every overhauling; but without removing it from the car. After the drain cock has been removed and an air vent attached, water is pumped into the reservoir to a pressure of 160 lb., although the normal air pressure for braking is but 70 lb. This test has proved effective in avoiding reservoir troubles.

News of Electric Railways

Traffic and Transportation
Financial and Corporate
Personal Mention
Construction News

Mayor on St. Louis Controversy

Sets in Motion Plan for Renewing Conferences with United Railways—First Meeting on June 20

The plan of the city of St. Louis, Mo., to take up actively again the settlement of its differences with the United Railways is gradually unfolding. As stated in the ELECTRIC RAILWAY JOURNAL of June 16, page 1109, Mayor Kiel announced that on June 15 he would send a special message to the Board of Aldermen asking the members to appoint a committee of three who with the Mayor and City Counselor shall be authorized to take up the existing controversy with the United Railways over the mill tax. The Mayor carried his plan to the Board of Aldermen on June 15, in accordance with his announced purpose, but Alderman Schwartz and others rebelled against the plan of the Mayor to create a special committee including City Counselor Daues to conduct United Railways compromise negotiations. By a vote of nineteen to nine the Aldermen decided to eliminate Counselor Daues, an appointive official, and substitute Comptroller Louis Nolte, an elective official. Alderman Schwartz is chairman of the public utilities committee, and the effect of Mayor Kiel's special request was to take away from the standing committee headed by Mr. Schwartz the consideration of the United Railways tangle. Nathan Hall, acting president of the Board of Aldermen, appointed as a special committee of aldermen, Messrs. Tamme, Bergt and Schrantz. Comptroller Nolte and Mayor Kiel will act also for the city.

A few minutes after this matter had been disposed of Alderman Tamme introduced a second resolution directing the standing committee on streets, sewers and wharves to take steps to select the route of an interurban loop downtown in connection with the free bridge. This was a subject of legislation which for two years had also been referred to the public utilities committee.

On the same day Mayor Kiel wrote a letter to Richard McCulloch, president and general manager of the United Railways, asking him to name a committee of five to confer with the city's committeemen in the Mayor's office on June 20. The Mayor said this meeting and all subsequent ones would be open to the public.

Rapid Transit Commission Suggested

Mayor Davis of Cleveland Announces His Intention of Seeking to Create a Rapid Transit Commission

As a result of recommendations of the city planning commission and a number of civic organizations, Mayor Harry L. Davis of Cleveland, Ohio, has announced his intention of asking the City Council to authorize the appointment of a rapid transit commission, the submission to the voters of a bond issue for a sufficient amount to extend the subway entrance to the new Cuyahoga River bridge to the Public Square, and for the construction of an underground terminal at the Public Square. This work would require about $3,500,000.

The city charter provides for a rapid transit commission of five members to serve without compensation, when it is decided that such a commission is necessary. The commission would be authorized to lease any underground railway or rapid transit line to the Cleveland Railway. In this its operation would be similar to that of the Cincinnati plan.

It is believed by members of the city planning commission and others that, if the subway is ever to be extended in Superior Avenue to the Public Square, now is the time to do it while the underground approach to the bridge is under construction.

The proposed plans include two loops of track under the Public Square and terminal arrangements which would provide a concourse over the tracks, so that patrons could reach their cars directly by descending a stairway from this concourse, thus making it unnecessary to cross the tracks.

Arguments were presented to the Mayor for the immediate completion of this portion of an underground system, extensions in other directions to be taken up later. The experience gained in building the proposed stretch of underground road would reach many things that are peculiar to the city, and in future work officials could be guided by the experiences in this construction.

Chicago Legislation Lost

Chicago Traction Bills Die in House Committee—Development as Recommended by the Chicago Traction and Subway Commission at Standstill

After the four Chicago traction bills intended to supply the enabling legislation for Chicago's extensive traction plan had passed the Senate with a generous majority in their favor, they were reported to the House committee on public utilities and went to the third reading, when the committee adjourned finally without a record vote on any of the four measures. The General Assembly adjourned on Sunday morning after an all-night session on June 16. This means that the development of the Chicago transportation plan as recommended by the Chicago Traction & Subway Commission is at a standstill for a period of two years, or until the next meeting of the State Legislature.

Strike in Dayton

Sixty-six Employees of Dayton Line, Operating Fourteen Miles of Road and Fifty Cars, Struck on June 16

Sixty-six motormen and conductors of the Dayton (Ohio) Street Railway on June 16 drove their cars to the carhouses at 9 a. m., and declared a strike because the company had refused to recognize the union. They had previously been granted an increase of wages and were working under a schedule ranging from 26 to 32 cents an hour based on the length of service. Demands were made for 31 cents for night men and 32 cents for day men, with 16 cents an hour for substitutes.

The company has announced that the cars will be operated with volunteers from its own organization and new men living in the city. Not only had wages been increased, but the company had offered the men insurance entirely free of cost to them in lieu of recognition of the union. Several conferences were held with the men, and the officers of the company had been led to believe there would be no strike. It is said that organizers have been at work among the men for some time.

Among other things contained in a statement issued by the company is the following:

"The development of negotiations which led up to the present situation seems to indicate that our men are being persuaded against their own interest by an unknown influence, and the company will, therefore, endeavor to settle the matter without regard to the question involved in the recognition of the union or the right of doubtful outside influences to dictate its policy."

The wages of employees of other roads operating in the city have been increased, but as none of them recognize the union it is feared that an effort will be made to involve the men on the other lines.

Strike Investigation Closed

Washington Inquiry Concluded—Hearings in Progress More Than Five Weeks

The case before the Senate committee which has been investigating the recent strike of the employees of the Washington Railway & Electric Company, Washington, D. C., was closed on June 16, when counsel concluded their arguments. Senator Pittman announced that Senator Hughes, the chairman of the committee, who has been unable to attend any of the hearings, would probably not be able to join with the committee in its report to the Senate. He said, however, that Senator Hughes undoubtedly would be permitted to file his report, or to join with the committee in its report later.

Members of the investigating committee on June 18 began to frame individual statements of the facts in the case as they appear to them. As soon as all the members of the committee have these statements ready Senator Pittman, acting chairman of the committee, will call a meeting. He expects it will be possible to get the committee together in about a week's time. After the committee in executive session has considered the facts in the case it will then work on its recommendations to the Senate. Along with the suggestions made by counsel for the strikers, for the company and on behalf of the public, the committee will give consideration to the bill submitted to it by Secretary Wilson of the Department of Labor. This measure is designed to put an end to the causes of strikes and lockouts by clothing a commission with power to settle the questions of wages and hours of labor. The hearings before the Senate committee have extended over a period of five weeks.

Strike in Vancouver

A strike of conductors and motormen on June 13 tied up all the lines in Vancouver, North Vancouver and New Westminster, B. C., owned by the British Columbia Electric Railway. Not a wheel turned on the day of the strike, and the company made no effort to take the cars out of the carhouses. Hundreds of jitneys did a thriving business, but there were thousands of early workers who had to walk in from their homes in the outlying districts. The representatives of the union of employees presented a demand recently for an increase in wages to meet the high cost of living. The company offered a compromise which was not accepted.

It is stated that the company will make no effort to operate. Jitney competition has caused such a serious falling off in revenue that the cars in the city have for months been operated at a loss. There is said to be no intention of securing new men to replace the strikers. The strikers, it is claimed, realize that the company is unable to pay higher wages, but the men maintain that they cannot keep their families on the present wages. There has been no manifestation of hard feeling between the company officials and the union leaders, and both the company and the striking employees are looking toward the City Council for action that will remove the competing traffic.

A late report from Vancouver on the strike states that the 800 strikers on the company's lines have been joined by the 500 men employed by the same company in Victoria and that no cars are being operated in either city.

Columbus Suburban Franchise

The Columbus Railway, Power & Light Company, Columbus, Ohio, was granted a twenty-five-year franchise for its Westerville suburban line by the Franklin County Commissioners on June 13. This line is 10.364 miles in length. So long as the franchise has an unexpired period of not less than fifteen years, the control of the service is to be in the hands of the public, through the commissioners. They will exercise this authority through a street railway commissioner whose salary of not more than $50 a month is to be paid out of the revenue of the line.

The company is to receive an income of not more than 6 per cent on its present investment and 8 per cent on future capital required. The value of the investment was fixed at $350,000. For the first ten years the company waives all earnings on $75,000 of this amount, but a working capital of $25,000 is included, which makes the amount on which return shall be paid $300,000. All revenues are to be turned into the working fund and all expenses paid from it.

Three fare zones are provided between the Columbus city limits and the Westerville terminus, and the rate of fare for each zone is the same. There is to be a sliding rate of fare, the lowest to be 2½ cents per zone and the maximum 6 cents. At the start the fare is to be 4 cents per zone. Should this prove too high, the fare will drop to 3½ cents per zone when the working fund reaches $35,000. On the other hand, if it is too low, the rate will advance to 4½ cents per zone when the working fund reaches $15,000. In other words, the working fund is the barometer. The cash fare is to be 5 cents as long as the ticket fare is 4½ cents or less per zone, and 6 cents when the ticket fare is more than 4½ cents.

The public may purchase the line at the actual value ascertained at the time of purchase, plus 10 per cent. All disputes are to be settled by arbitration and the company must pay its share of public road improvements.

The company advertised the franchise in the Columbus *Dispatch* of June 16 as "a model for future street railway franchises in Ohio."

Baltimore Promotes Social Activities

United Railways & Electric Company Organizes Club for Social and Recreation Purposes

With a charter membership of 700 or 800 the employees in the offices of the United Railways & Electric Company, Baltimore, Md., are forming a club for social and recreation purposes. For years the company has provided clubrooms, bowling alleys, baseball diamonds, etc., for the platform men in its employ, but there has never been a definite organization for similar activities among the office employees.

T. A. Cross, president of the company, in a letter indorsing the movement has outlined the scope of the new organization, and made certain suggestions for the consideration of the board of governors of the new club. He has made it very clear, however, the participation of the officers as such will be in an advisory rather than in a governmental capacity.

The organization is to be composed of both women and men in the company's employ. Mr. Cross has indicated that the company will provide commodious and well-equipped clubrooms downtown close to the general offices, and will set aside for athletic purposes a portion of the tract owned by the company at its Columbia Avenue shops. This new field will not conflict with the athletic field at Columbia Avenue now used by the conductors and motormen. The name of the club will probably be the United's Recreatoinal League. Membership is to be contingent upon employment by the company, though the matter of making certain concessions to members of the families of employees is to be taken up at the organization meeting.

PRESIDENT CROSS INDORSES PROJECT

President Cross in his letter indorsing the project said:

"In considering the question in its entirety, two sides have appeared to me. First, since an employee spends so much of his life in the place of his employment, it is highly desirable, from his standpoint, that both the place and the people with whom he is associated should be altogether congenial in order that his work may not become mere drudgery. An organization or a series of recreational activities that will throw the employees together more in social intercourse is bound in time to make the business surroundings more congenial. This is the employees' side. Second, when a body of employees is happy in the working surroundings and harmonious relations are maintained between the individual employees, they are bound to be more efficient. As a strictly business proposition, then, I feel that in offering such a project the company's heartiest support, I am simply making an investment which should be parallel to providing proper ventilation or clean floors in the offices. This is the company's side. Keeping both sides of the whole matter constantly in mind, I believe that the little innovation which it is now proposed to introduce will, in course of time, prove exceedingly beneficial to all concerned."

Compromise in Duluth

Agreement Reached with City as a Result of Which Condemnation Proceedings Will Be Withdrawn

The Duluth (Minn.) Street Railway has entered into a compromise agreement with the City Council as a result of which condemnation proceedings to take over the system under municipal management will be dropped. The company agrees to the immediate construction of an extension of its line from Morgan Park to New Duluth, a distance of 2¾ miles, a 5-cent fare on all lines at the end of the war, or in any event not later than Jan. 1, 1920, and universal transfers on all lines now constructed or to be built within the city limits.

The agreement was reached at a conference on June 18 between the City Commissioners and A. M. Robertson, Minneapolis, president of the company. It calls for the operation of the New Duluth line before Dec. 31, 1917. The United States Steel Corporation, through whose property the extension will be projected, is now preparing the right-of-way at a cost to it of $146,000. Under the terms of the compromise the company will continue to charge an extra fare for rides west of Eighty-fourth Avenue West going west and east of Forty-ninth Avenue West going east on the Morgan Park-New Duluth line until the time fixed by the agreement. The attitude of the city officials in the matter is expressed by Mayor Magney, who said:

"In view of the unsettled world conditions the adjustment now made is probably the best that could be obtained. It complies with the original demands of the city from the street railway before condemnation proceedings were authorized by the City Council. Municipal ownership of the street railway system is simply deferred, and the condemnation proceedings may be instituted at any time the city may find it necessary. The policy of the street railway in the future will have to be different from that which it has pursued in the past."

P. G. Phillips, commissioner of public utilities and a staunch advocate of municipal ownership of all utilities, cast the only vote against rescinding the action of the Council in condemning the street railway system.

Public Utilities in Russia

Under the title, "Public Utilities in Russia" there appeared in the May issue of *Russia*, a journal of Russian-American trade, an article in part as follows:

"Among the many lines of investment in Russia which will deserve the attention of American capital probably few are likely to be more attractive in the combination of safety with good returns than the loans which will be made by hundreds of Russian cities and towns for the construction of public utilities. On this subject Richard Martens of R. Martens & Company, Inc., New York, in a note among others on the results of his investigation of Russian conditions last summer, says:

" 'Nearly all the cities and towns visited on our tour which do not already possess requisite civic improvements are preparing to float loans for the purpose of constructing tramway, lighting, water-supply and drainage systems—only another evidence of the widespread awakening of the people at large and their demand for improvements. As a result of the towns having spent little or nothing on municipal improvements, the municipal indebtedness is lower than anywhere else in the civilized world. Furthermore, before a municipal loan is floated, the proposal must be submitted in full detail to the Minister of Finance at Petrograd. There the matter is carefully studied and worked out with due consideration of the existing tax rate; and when finally the loan is approved it is fully guaranteed by the government.'

"The extent to which the town and urban areas of Russia lack the public utilities that the whole people is now demanding may be judged from certain statistics of 1913. In respect to tramways, or street railway systems, the number of towns equipped is of course much smaller than those having some sort of general water supply. Electric lighting, on the contrary, has made considerable progress, having been adopted in a considerable number of small towns."

Attempt at Strike Fails

Employees at Bloomington Stand by the Company Against Outside Influence

The breaking of an agreement existing between the car men and the Bloomington & Normal Railway & Light Company, Bloomington, Ill., resulted in an incipient strike of about 15 per cent of the men employed by the company on May 18. Previous to this time the car men had been working under an agreement dated to expire on Sept. 1, but the company, realizing the increase in living costs, offered a new agreement to be effective from June 1, providing for an increase of approximately 10 per cent.

The proposed new agreement was signed by a majority of the men. Seven of the car men, under the leadership of outside organizers, refused to accept the agreement and five more were discharged for cause. These twelve employees then declared a "strike" against the company. Their places were immediately filled, as were those of fourteen additional men who left their posts.

The company continued to give full car service with the exception of a slightly curtailed night schedule during the early period of the trouble. Traffic has shown only a slight decrease from normal.

A campaign of intimidation and therats against working car men and their families made resort to the courts necessary, and on June 9 an injunction was issued by the court in favor of the company and its employees restraining the strikers from using violence against the company's employees and property, intimidating passengers or distributing literature designed to discourage riding upon the cars.

Previous to the granting of the injunction the men issued the following statement to the public:

"We, the undersigned employees of the Bloomington & Normal Railway & Light Company, being motormen and conductors, desire the public to know that we are satisfied with our employment, and that the wages and conditions are agreeable. Each of us is working under an unexpired contract of employment. All we ask is to be left alone so we can fulfill our duties."

This statement was signed by fifty of the working car men and had an appreciable effect upon public sentiment.

In sympathy with the striking car men a majority of the employees in the power house left employment with the company on June 12. Their places were filled promptly and power service continued without interruption.

An agreeable feature of the unpleasantness has been the demonstration of an excellent spirit of co-operation between the faithful employees and the company. This is commented upon editorially in the current issue of the *B. & N. Light*, the company's house organ. The title of the editorial is "Boys, We Thank You." It follows in part:

"The spirit shown by the employees of this company has been an exhibition of loyalty and bravery seldom equaled. It is a matter of deep gratification to know what loyal fearless fellow workers we have and we take this opportunity of assuring all of you of the deep sense of obligation which your splendid conduct has left in us.

"Your brave action in sticking to your posts has meant that we have been able to give to the citizens the service which it is our duty and obligation to give. To every man who has fulfilled the trust placed in him are due the thanks and the deep appreciation of the city.

"All we ask is that we be allowed to attend to our work without annoyance, molestation or interference. We obey the laws, we fulfill our obligations, not only as an industry but as citizens, and the activities of outside trouble makers and agitators seeking, for their own advantage, to stir up mischief, have not nor will they cause us to swerve from our work so necessary to the welfare of the city.

"Your welfare and interests are to us a matter of deep concern and we promise you that we shall leave nothing undone to lighten your added burdens. Your personal courage speaks for itself.

"If it has done nothing else but shown your loyalty and good will and brought out this spirit of fellowship and co-operation, the situation will have been worth all the annoyance it has caused."

Southern Pacific Electric Extension Opened.—The electric line extension of the Southern Pacific Railway from Whiteson to Corvallis, Ore., began operation on June 17. The extension is 40 miles long.

Employees Must Stand Through Congested Portions of Cities.—While street and interurban railways must furnish seats for conductors and motormen at other times, Attorney General McGhee of Ohio has ruled that the men in charge of cars must stand while passing through congested portions of cities.

I. C. C. Bill Before House.—The bill increasing the number of members of the Interstate Commerce Commission from seven to nine was brought up in the House on June 13 and was made unfinished business whenever that order of business is again reached, which may be in two or three weeks. The bill has already passed the Senate.

More Utilities Buy Coal Properties.—The Elmira Water, Light & Railroad Company, Elmira, N. Y., is reported to have purchased for $150,000 the properties of the Queenstown Coal Company at East Brady, Pa., with an annual output of 30,000 tons, while the American Light & Traction Company is reported to have bought certain properties of the White Star Coal Company in Harlan County, Ky.

Men at Alliance Get Demanded Increase.—The board of arbitration on June 15 decided in favor of the employees of the Stark Electric Railroad and the Cleveland, Alliance & Mahoning Valley Railway and awarded them the advance in wages demanded, 5 cents an hour. All other matters up for settlement between the company and the men were agreed to before the strike was declared. The split came over the question of wages.

Atlantic Coast Assessment Confirmed.—The Supreme Court of New Jersey has affirmed the assessment levied by the State Board of Taxes and Assessment upon the gross receipts of the Atlantic Coast Electric Railway, Asbury Park, N. J., amounting to $363,742. The company sought to have a reduction of $67,752 made for current delivered to the Atlantic Coast Electric Light Company, but the Supreme Court ruled that the company must pay its tax on this sum.

B. J. Arnold Engaged by Baltimore.—The Mayor of Baltimore, Md., has engaged Bion J. Arnold, Chicago, Ill., as consulting engineer to advise the city in connection with the plans for improvement which have been laid before the Mayor by the Pennsylvania Railroad. These plans include new tunnels through the city to convert the Philadelphia, Baltimore & Washington into a four-track railroad. The public meanwhile is urging the Mayor to require the railroad to install electricity as motive power on its tunnel lines.

Third Arbitrator to Be Called in East St. Louis.—The two arbitrators who have been considering the differences between the employees and the East St. Louis & Suburban Railway, East St. Louis, Ill., have been unable to agree on the wage question and have decided to name a third arbitrator to act with them under the terms of the arbitration agreement. Up to June 19 ten names had been submitted, but none of those proposed was acceptable to both sides. The situation remained unchanged on June 21 with respect to the selection of the third member.

Twin Peaks Tunnel Line at San Francisco Soon Ready.—The work of lining the Twin Peaks tunnel has been completed and the finishing touches are being put on the stations at Laguna Honda and the two portals. The Board of Public Works called for bids for June 20 on the construction of a double-track line from Market and Castro Streets through the tunnel to Sloat Boulevard beyond the west portal, a total distance of about 3 miles. It is expected that this work will be completed in time to allow cars to be operated through the tunnel before the first of next year.

Budget Plan for Bonds Advocated at Cincinnati.—Alfred Bettman, speaking before the New Charter Commission recently, advocated that bond issues for each year be made up on the budget plan by the Mayor and that all be acted upon at once. This would prevent the haggling and unsatisfactory results that sometimes arise out of bond legislation all through the year. Mr. Bettman also argued in favor of creating a municipal public utilities commission, which would have charge of all the utilities of the city. This would mean that the jurisdiction of the Rapid Transit Commission would be changed to include all other utilities in addition to the new loop that is to be constructed.

Wage Conferences in Ogden.—Representatives of the employees of the Ogden, Logan & Idaho Railway, Ogden, Utah, and the officials of the company are conferring over the matter of wages. Under the old scale the men received 25 cents an hour for the first two years, 27½ cents for the third and fourth years, and 30 cents an hour thereafter. The company offers to sign a new contract providing for the payment of 25 cents an hour for the first year, 27 cents an hour for the second year, 30 cents an hour for the third and fourth years and 32 cents thereafter. It is said that the men consider the offer of the company inadequate owing to the present era of high costs.

Frontier Case Again Before Commission.—Further objections were made on June 7 before the Public Service Commission for the Second District of New York by the New York Central Railroad against the project of the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railway to use the tracks of the Frontier Electric Railway for a main connecting link for their freight traffic between Buffalo and Niagara Falls and Canada. It was indicated by the commission that it would require still further testimony before taking action on the revocation of the Frontier's certificate. This matter has been referred to previously in the ELECTRIC RAILWAY JOURNAL for Jan. 20, page 135; Feb. 10, page 262, and April 14, page 706.

Paving Claims Paid.—The Central Park, North & East River Railroad, New York, N. Y., has paid to the city $184,524, representing the first dividend of 75 per cent upon judgments obtained by the city and claims allowed by the referee. The actions upon which judgments were obtained and the claims established before the referee were, for the most part, predicated upon certain provisions of the railroad law, which obligated street railways to maintain the pavement between their tracks and for 2 ft. outside. Because of the refusal of the Central Park, North & East River Railroad to maintain the pavement areas when notified to do so, the city did the paving at its own expense and charged it to the company. The case was carried by the railroad through the Court of Appeals.

Injunction Against Abandonment of Unprofitable Line.—A public carrier will not be permitted to abandon a branch of its system because it is not profitable, states Judge Arthur M. Wallace, in the Jefferson Circuit Court at Louisville, who has granted a temporary restraining order against the Louisville (Ky.) Railway. The company, required by the Board of Park Commissioners to remove a double track on Forty-sixth street to the side of the street, has proposed abandoning the half mile of track, which leads from the terminus of the Broadway line to a summer amusement park, operated only in a small way and served by another line of the railway. Suit brought by the owner of the amusement resort led to the injunction. Cost of the changes to the railway would be $14,000, it was stated by the company, and patronage would not justify the outlay.

Seattle Mayor States His Attitude on Bridge Matter.—Although the City Council of Seattle, Wash., has passed two ordinances both intended to prevent street railway traffic by the Puget Sound Traction, Light & Power Company over the Fremont bridge, until the company agrees to pay $1,000 a month for the privilege of operating over the structure, or in lieu of that a lump sum of $60,917 and $333 a month thereafter, Mayor H. C. Gill has announced that cars are to operate over the structure. The Mayor, who has the power to prevent the operation of cars over the bridge, stated that he would not take any action to deprive the people of the north end of the city of car service. He regards the interests of the public to be paramount to any dispute between the city and the company and expresses the opinion that the question of rental is one that can be agreed upon by the parties interested, or be fixed by the courts.

St. Louis Loop Matter Up Again.—In addition to negotiating the compromise with the United Railways, St. Louis, Mo., the special committee appointed from the Board of Aldermen was instructed to investigate the question of a municipal interurban loop, down town, to accommodate the electric railway lines that use the Free Bridge. The municipal loop question has been under consideration for more than a year by the Board of Public Service. Two routes have been suggested. The route which is favored by the board at present would be north on Seventh Street from the Papin Street terminus of the highway approach to a loop bounded by Walnut, Sixth, Chestnut and Seventh Streets. The other route under consideration would extend north on Fourth Street to Morgan, west to Eleventh Street, connecting with the Illinois Traction System tracks, and back to Seventh Street and Clark Avenue by way of streets that have not been determined.

Bonds Proposed for Tacoma Municipal Extension.—First action toward the building of the Eleventh Street municipal railway extension to the east side of the bay to connect with the big shipyards was taken by the City Council of Tacoma, Wash., recently when the ordinance was introduced authorizing the issuance of $180,000 of city utility bonds to provide funds to build, equip and place the line in operation. The line may be single or double track. C. D. Atkins, the commissioner of public works, is placed in charge of construction. While no arrangement has been made for the sale of the bonds, it has been officially agreed that the money is to be taken temporarily from the light and power reserve fund. To make this possible it was necessary to include in the ordinance a clause requiring that the car line be operated to produce sufficient revenue to pay off the principal and interest. Should the line fail to provide this amount, the deficit is to be paid by drawing upon such sources of revenue as come from corporation taxes. These requirements were included in the ordinance through the necessity of protecting the city in the purchase of the bonds.

Seattle Elevated Will Cost $937,000.—According to a report made to the City Council of Seattle, Wash., by A. H. Dimock, city engineer, the extension of the municipal street railway proposed by Councilman Oliver T. Erickson, by the construction of an elevated street railway on Washington Street, from Fourth Avenue South to Railroad Avenue, and on Railroad, Whatcom Avenue and West Spokane Street, to the West Waterway, and an extension with the Ballard lines, will cost $937,000. The report places the cost of the double-track elevated of steel on Washington, from Fourth Avenue South to Railroad Avenue, at $550,000; cost of a double-track wood-trestle railway on Railroad Avenue, Whatcom Avenue, and Spokane Street to the West Waterway at $300,000; sidewalk along one side of the wooden structure along Railroad and Whatcom Avenues, $12,000; extension of Division A of the municipal line from Thirteenth to Fifteenth Avenue West, and from north end of Fifteenth Avenue N. W., bridge on Leary Avenue, to Market Street, $75,000. Mr. Dimock estimates that by building a portion of the line on Railroad, Whatcom and Spokane, where there are no railway tracks to interfere at the present time, the cost may be reduced about $40,000.

Kentucky Franchise Tax Decision.—As noted briefly in the ELECTRIC RAILWAY JOURNAL for June 16, page 1111, the railways operating in Kentucky have gained an important victory in a recent decision of the Supreme Court of the United States in the matter of franchise taxation. The finding applies to the electric railways as well as to the steam railroads. The Louisville & Interurban Railway was a party to one of the group of cases. The court in effect holds that railroads and public utility corporations have the right to the same equalization of their property values for purposes of taxation as is enjoyed by the owners of other property. The question common to all of the cases at issue was as to the rights of the railroads to have their property assessed for taxation at no higher proportion of its actual value than other property throughout the State is assessed. In its decision the United States Supreme Court upheld the Federal Circuit Court for the Eastern District of Kentucky, holding that property in general throughout the State is assessed at not exceeding 60 per cent of its actual value, and that the railroads have the right to insist that their properties shall not be assessed at more than 60 per cent of their actual value.

Financial and Corporate

Annual Reports

Havana Electric Railway, Light & Power Company

The comparative income statement of the Havana Electric Railway, Light & Power Company, Havana, Cuba, for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	P Cent
Gross earnings	$6,017,708	100.00	$5,541,302	100.00
Operating expenses and taxes	2,443,885	40.61	2,337,506	42.18
Net earnings	$3,573,823	59.39	$3,203,796	57.82
Other income	144,561	2.40	147,874	2.66
Gross income	$3,718,384	61.79	$3,351,672	60.48
Fixed charges	1,297,093	21.55	1,115,414	20.13
Net income	$2,421,291	40.24	$2,236,258	40.35

A summary of the operations of the various departments also follows:

Department	Gross Earnings from Operation	Operating Expenses and Taxes	Per Cent of Gross Earnings	Net Earnings from Operation	Per Cent of Gross Earnings
Electric railway	$3,122,362	$1,346,260	43.12	$1,776,102	56.88
Electric light	2,099,059	552,236	26.31	1,546,824	73.69
Gas	575,290	344,927	59.95	230,363	40.05
Stage lines	219,334	198,874	90.67	20,459	9.33
Electric omnibuses (one month)	1,662	1,558	95.54	74	4.46
Total	$6,017,708	$2,443,885	40.61	$3,573,823	59.39

The most notable developments of the last year were in the new business of the electrical and gas departments, although the results of railway operation were better than in any preceding year. The total number of passengers carried on the cars during 1916 was 59,698,791, an increase of 9.93 per cent over 1915. In the electrical department the gross earnings increased 13.09 per cent and the net earnings 13.68 per cent, while in the gas department the gross gained 12.2 per cent and the net 23.6 per cent.

Comparative statistics of operation for the railway department in 1916 and 1913 show the following results:

	1916	1913	Per Cent Change
Number of passengers carried	59,698,791	56,782,362	+ 5.14
Passenger car-miles	12,143,682	10,543,739	+15.17
Passenger earnings	$2,984,939	$2,839,118	+ 5.14
Passenger earnings per car-mile	$0.2458	$0.2693	— 8.73
Operating expenses	$1,307,928	$2,909,233	— 8.34
Operating expenses per car-mile	$0.1076	$0.1353	—20.47
Operating ratio (per cent)	41.89	49.05	—14.60
Net earnings from operation	$1,814,434	$1,482,260	+22.40

The foregoing comparison is made with 1913 because this was the last preceding year that showed a normal growth. During 1914 and 1915 traffic conditions in Havana were very much disturbed by the abnormal extent of unemployment.

The earnings of the stage lines continued to decrease, the loss in 1916 being $45,937 or 17.3 per cent. The falling-off was partly due to labor conditions, but mainly to the preference of the public for the street cars. It is expected that the electric motor omnibuses, twelve of which were placed on trial last December, will enable this service to be continued with profit.

Cleveland, Painesville & Eastern Railroad

The operating revenues of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, for the calendar year 1916 totaled $441,139, an increase of $37,087, while the operating expenses rose $30,951 to $222,988, leaving net revenue from railway operations of $218,150, a gain of $6,136. Taxes at $27,280 showed a slight increase, so that the operating income of $190,870 represented a gain of $5,329. Non-operating income fell off a little, and the deductions from income, mostly owing to miscellaneous debts, increased $4,162 to a total of $137,414. The surplus of

$56,329 for the last year, therefore, was only $1,062 greater than that of 1915. The gain in operating revenues for 1916, amounting to 9.08 per cent, was in marked contrast to the result obtained in 1915, a loss of 0.36 per cent. The 1916 percentage gain was the best since 1910, while the numerical gain was the largest in the company's history.

The increased earnings per mile during 1916 are shown below: Operating revenues per mile, $11,512, an increase of $968; operating expenses per mile, $5,819, an increase of $807; net operating revenue per mile, $5,693, an increase of $160, and operating income per mile, $4,980, an increase of $139. The total expenditures for additions and improvements chargeable to capital account in 1916 were $68,340.

Electric Railway Statistics

Rising Costs Affect the East—Comparison of Returns for March, 1917, and for the Quarter, January-March, 1917, with Those for 1916

A comparison of electric railway statistics for the quarter, January-March, 1917, with figures for the corresponding months of 1916, made by the information bureau of the American Electric Railway Association, indicates that the expenses during this period have increased faster than the revenues. The rising costs of materials and supplies used by electric railways, together with increases in wages and taxes paid, have disastrously affected electric railways throughout the country and particularly those operating in the Eastern district.

Data for the three months ended March 31, 1917, representing 9717 miles of line of companies scattered throughout the country, figured on the per mile of line basis, indicates an increase in operating revenues of but 6.25 per cent, while operating expenses increased 10.93 per cent and net earnings decreased 1.99 per cent. Data representing approximately 75 per cent of the above mileage indicate an increase in the amount of taxes paid of 7.65 per cent and a decrease in operating income of 8.13 per cent.

The returns from the city and interurban electric railways, as shown in detail in the appended table, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

Of the three groups shown in the accompanying table, returns for the Southern and the Western apparently indicate a slight degree of improvement over the corresponding period of the previous year, while returns for the Eastern are decidedly unsatisfactory. Data for the latter district, representing 6428 miles of line, indicate an increase in operating revenues of 6.25 per cent, in operating expenses of 12.85 per cent and a decrease in net earnings of 5.15

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS, MARCH, 1917 AND 1916

Account	United States				Eastern District				Southern District				Western District			
	Amount, March, 1917	Per Mile of Line			Amount, March, 1917	Per Mile of Line			Amount March, 1917	Per Mile of Line			Amount, March, 1917	Per Mile of Line		
		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase
Operating revenues	$20,947,801	$2,156	$2,016	6.94	$14,956,486	$2,327	$2,174	7.04	$1,384,733	$1,304	$1,224	6.54	$4,606,582	$2,069	$1,943	6.48
Operating expenses	13,751,218	1,415	1,281	10.46	9,927,049	1,544	1,380	11.88	782,016	736	718	2.51	3,042,153	1,366	1,264	8.07
Net earnings	7,196,583	741	735	0.82	5,029,437	783	794	†1.39	602,717	568	506	12.51	1,564,429	703	679	3.53
Operating ratio, per cent	1917, 65.65; 1916, 63.54				1917, 66.35; 1916, 63.47				1917, 56.44; 1916, 58.60				1917, 66.02; 1916, 65.05			
Average number of miles of line represented	1917, 9,717; 1916, 9,621				1917, 6,428; 1916, 6,359				1917, 1,062; 1916, 1,059				1917, 2,227; 1916, 2,203			

COMPANIES REPORTING TAXES

Account	United States				Eastern District				Southern District				Western District			
Operating revenues	$15,925,326	$2,134	$2,030	5.12	$10,500,275	$2,262	$2,167	4.38	$847,613	$1,298	$1,214	6.92	$4,577,438	$2,113	$1,985	6.45
Operating expenses	10,797,358	1,447	1,328	8.96	7,306,655	1,574	1,438	9.46	470,065	720	682	5 57	3,020,638	1,395	1,289	8.22
Net earnings	5,127,968	687	702	†2.14	3,193,620	688	729	†5.62	377,548	578	532	8.65	1,556,800	718	696	3.16
Taxes	1,125,856	151	140	7.86	725,545	156	143	9.09	69,672	107	101	5 94	330,639	153	145	5.52
Operating income	4,002,112	536	562	†4.63	2,468,075	532	586	†9.22	307,876	471	431	9.28	1,226,161	565	551	2.54
Operating ratio, per cent	1917, 67.80; 1916, 65.41				1917, 69.58; 1916, 66.35				1917, 55.46; 1916, 56.18				1917, 66.01; 1916, 64.93			
Average number of miles of line represented	1917, 7,461; 1916, 7,369				1917, 4,642; 1916, 4,573				1917, 653; 1916, 653				1917, 2,166; 1916, 2,143			

†Decrease.

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR QUARTER, JANUARY-MARCH, 1917 AND 1916

Account	United States				Eastern District				Southern District				Western District			
	Amount, January-March, 1917	Per Mile of Line			Amount, January-March, 1917	Per Mile of Line			Amount, January-March, 1917	Per Mile of Line			Amount, January-March, 1917	Per Mile of Line		
		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase
Operating revenues	$60,005,005	$6,175	$5,812	6 25	$42,693,189	$6,642	$6,251	6.25	$3,955,892	$3,725	$3,550	4.93	$13,355,924	$5,997	$5,633	6 46
Operating expenses	39,930,526	4,109	3,704	10.93	28,734,534	4,470	3,961	12.85	2,300,032	2,166	2,073	4.49	8,895,960	3,995	3,748	6.59
Net earnings	20,074,479	2,066	2,108	†1.99	13,958,655	2,172	2,290	†5.15	1,655,860	1,559	1,477	5.55	4,459,964	2,002	1,885	6.21
Operating ratio, per cent	1917, 66.54; 1916, 63.73				1917, 67.30; 1916, 63.37				1917, 58.15; 1916, 58.39				1917, 66.62; 1916, 66.54			
Average number of miles of line represented	1917 9,717; 1916, 9,621				1917, 6,428; 1916, 6,359				1917, 1,062; 1916, 1,059				1917, 2,227; 1916, 2,203			

COMPANIES REPORTING TAXES

Account	United States				Eastern District				Southern District				Western District			
Operating revenues	$45,726,718	$6,129	$5,862	4.55	$30,035,511	$6,470	$6,247	3.57	$2,421,209	$3,708	$3,515	5.49	$13,269,998	$6,126	$5,755	6.45
Operating expenses	31,435,899	4,213	3,846	9.54	21,241,282	4,576	4,125	10.93	1,363,515	2,088	1,975	5.72	8,831,102	4,077	3,821	6.70
Net earnings	14,290,819	1,916	2,016	†4.96	8,794,229	1,894	2,122	†10.74	1,057,694	1,620	1,540	5.19	4,438,896	2,049	1,934	5.95
Taxes	3,255,475	436	405	7.65	2,077,168	447	408	9 56	204,468	313	297	5.39	973,839	450	430	4 65
Operating income	11,035,344	1,480	1,611	†8.13	6,717,061	1,447	1,714	†15.58	853,226	1,307	1,243	5 15	3,465,057	1,599	1,504	6.32
Operating ratio, per cent	1917, 68.74; 1916, 65.61				1917, 70.73; 1916, 66.03				1917, 56.31; 1916, 56.19				1917, 66.55; 1916, 66.39			
Average number of miles of line represented	1917, 7,461; 1916, 7,369				1917 4,642; 1916, 4,573				1917, 653; 1916, 653				1917, 2,166; 1916, 2,143			

†Decrease. There were twenty-nine days in February, 1916, and only twenty-eight days in February, 1917.

per cent. Returns representing approximately 75 per cent of the above mileage show an increase in the amount of taxes paid of 9.56 per cent and a decrease in operating income of 15.58 per cent. Returns for the Southern and Western groups indicate that expenses have increased at about the same percentage rate as the earnings. Both groups show, however, increases of approximately 6 per cent in net earnings and 5 per cent in operating income.

The operating ratio for the country as a whole has increased from 63.73 per cent in 1916 to 66.54 per cent in 1917. The operating ratio of the Eastern district has increased from 63.37 per cent in 1916 to 67.30 per cent in 1917. The operating ratios of the Southern and Western groups have changed very little.

Columbus, Delaware & Marion Sold

Ohio Road Disposed of at Foreclosure to R. H. Beaton—Reorganization Plan

Ralph H. Beaton,, 20 East Broad Street, Columbus, Ohio, representing Eastern capitalists, purchased the property of the Columbus, Delaware & Marion Railway at receiver's sale on June 11, for $417,494. The court had fixed a minimum price at $250,000. The company has underlying bonds amounting to $1,582,505 and some other obligations. Appraisers had fixed the total value of the property at $2,000,000. The sale was made subject to the mortgages and other claims.

The reorganization of the company under its new ownership has been approved by the Ohio Public Utilities Commission. The new company is authorized to issue $700,000 of common stock, $650,000 of 7 per cent preferred stock and $1,994,000 of 5 per cent twenty-year bonds, secured by mortgage on the entire property and franchises. Of the bonds $1,533,000 will be exchanged for underlying bonds of the old company and $100,000 will be sold to obtain funds for improvements during the present year.

Mr. Beaton has made no announcement of the personnel of the new owners, other than to say they are Eastern capitalists. It is understood that the name of the new company is the Columbus, Delaware & Marion Electric Company of Columbus. This company was incorporated recently by Samuel L. Finn, Daniel Blau, I. Webb, Ira Crawford and M. F. Sheeler.

Platform of Investors' Protective Association

Publicity, Proper Compensation for Service and Square Deal for Corporations Asked

The first regular meeting of the advisory council of the Investors' Protective Association of America, organized by N. L. Amster, was held recently. Those who attended were I. Reynolds Adriance, president of Merchants National Bank, Poughkeepsie; John A. Sleicher, editor *Leslie's Illustrated Weekly;* Oliver M. W. Sprague, professor of banking and finance, Harvard University; Peter G. Ten Eyck, former congressman from New York. Among the principal planks in the platform adopted were:

Vigorous opposition to wasteful and inefficient management of corporations.

All possible publicity respecting every corporate activity.

Waken, educate and enlighten the public to a realization that it is not only just, but to its interests, that railroads and public utility corporations receive proper compensation for their service.

Receivers shall not be appointed without first giving public notice to all parties in interest.

Reorganization committees to be chosen by a poll of security holders.

Readjust method and system of issue and sale of corporate securities so as to make corporations less dependent upon any single or collective group of banking and financial interests.

Mold public opinion as to the rights of minority stockholders and insist that they shall always have representation on the board of directors.

The slogan is "a square deal alike for corporations, security holders and the public."

Positive direct responsibility of directors and corporate managers. Severe penalties for misrepresentation of facts and for improper use of corporate funds or other corporate property.

Mr. Amster attracted nation-wide attention by his opposition to the receivership for the Chicago, Rock Island & Pacific Railway. Although he failed to prevent the appointment of a receiver he carried on his fight and subsequently was made chairman of the board of directors of the company. The road was rehabilitated out of current funds and Judge Carpenter only recently in the federal court terminated the receivership of the company without foreclosure.

R., S. & E. Bond Deposits Increase

The readjustment committee of the Rochester, Syracuse & Eastern Railroad, Syracuse, N. Y., has turned over to the bondholders' protective committee of that road bonds amounting to $357,000 which had been deposited with it. This leaves the latter committee as the only one in the reorganization of the railway. The bondholders' protective committee had deposited with it previous to this $4,165,000 of the $4,986,000 of bonds outstanding. The total now held by the protective committee is therefore $4,522,000, leaving $374,000 yet to be deposited.

Alabama Traction, Light & Power Company, Ltd., New York, N. Y.—The total operating revenues of the Alabama Traction, Light & Power Company, Ltd., for the calendar year 1916 were $1,471,433, and the total earnings $1,515,953, a gain of $474,805, or 45 per cent. Of the operating revenues $110,758 came from the railway department as compared to $86,349 in 1915, an increase of $24,409, or 28 per cent. The railway operating expenses at $93,319 represented an increase of $21,644, or about 30 per cent for the year.

American Cities Company, New York, N. Y.—The American Cities Company has passed its usual semi-annual dividend of 1½ per cent. The company has paid the dividend since July 1, 1915. Lee Benoist, vice-president of the company, is reported to have said: "Notwithstanding the fact that the earnings of the American Cities Company are showing very satisfactory increases, the directors felt that in view of current market conditions for corporation securities the earnings of the company should be applied to the purchase of its subsidiary companies' securities, issued for their general development purposes and, therefore, decided that for the time being a distribution on the preferred stock should be deferred. This action is recognized as materially strengthening the financial situation of the shareholders of the American Cities Company."

Buffalo (N. Y.) Southern Railway.—The bondholders of the Buffalo Southern Railway, operating between the Buffalo city line and Hamburg and Orchard Park, have until July 1 to decide whether to improve the road or dispose of the property to interests that will rehabilitate it. The Public Service Commission has recommended improved service and the betterment of the condition of the equipment. Towns along the company's line have complained about the service and equipment. The railway is in the hands of a receiver. The cars operate over the tracks of the International Railway between the Buffalo city line at Seneca Street and the terminal at Main and Clinton Streets. At one time the International Railway made an effort to acquire the property.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—Harris Forbes & Company, New York, N. Y., announce an offering of $1,000,000 of first lien and refunding 5 per cent gold bonds of the Consumers' Power Company, a subsidiary of Commonwealth Power, Railway & Light Company. The issue has been authorized by the Michigan Railroad Commission, based on appraisals made of the company's property. The offering is at 95. The bonds are due on Jan. 1, 1936, and are callable at 105 and interest on any interest date.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The stockholders of the Mahoning Valley Railway, Mahoning Valley Southeastern Railway, Youngstown Park & Falls Street Railway and the Youngstown & Sharon Street Railway have ratified an agreement for the merger of these companies with the Mahoning & Shenango Railway & Light Company. As stated previously in the ELECTRIC RAILWAY JOURNAL the merger is being carried out entirely in the interest of intercorporate simplicity.

New Jersey & Pennsylvania Traction Company, Trenton, N. J.—The New Jersey & Pennsylvania Traction Company has filed a certificate with the Secretary of State of New Jersey reducing the authorized capital stock from $3,000,000 to $500,000, divided into 5000 shares.

Norton, Taunton & Attleboro Street Railway, Norton, Mass.—The Norton, Taunton & Attleboro Street Railway, successor to the Norton & Taunton Street Railway, has applied to the Massachusetts Public Service Commission for authority to issue $120,000 of twenty-year 5 per cent bonds and 12,000 shares of stock of a par value of $100 for the purpose of financing the purchase of and operating the railway and part of the property, including franchises and locations formerly owned by the predecessor company.

Pennsylvania & Ohio Railway, Ashtabula, Ohio.—The Pennsylvania & Ohio Railway, which operates the local city lines in Ashtabula as well as the interurban line between Conneaut and Jefferson, has been placed in the hands of Palmer Wardman, superintendent of the company, as receiver by Judge Roberts of the Common Pleas Court as the result of action brought by the Citizens' Savings & Trust Company, Cleveland, Ohio. There are three issues of bonds outstanding, namely, $600,000 of first mortgage 5s of the Pennsylvania & Ohio Railway, $100,000 of first 5s of the Pennsylvania & Ohio Railway, Jefferson division, and $200,000 of general 5s secured on the entire property, but subject of course to the other two issues. The Citizens' Savings & Trust Company is trustee of all the issues.

Sacramento Valley Electric Railroad, Dixon, Cal.—The sale of the property of the Sacramento Valley Electric Railroad under foreclosure, set for May 26, has been postponed until June 23. The road as at present constructed is 12 miles long.

Standard Gas & Electric Company, Chicago, Ill.—The Philadelphia Trust Company, trustee, is advertising for tenders of Standard Gas & Electric Company convertible 6 per cent sinking fund gold bonds maturing Dec. 1, 1926, to absorb $67,510 now available in the sinking fund. Tenders will be received until July 6.

Waycross Street & Suburban Railway, Waycross, Ga.—The property of the Waycross Street & Suburban Railway was sold on June 5 at receiver's sale to L. J. Cooper, acting for the Waycross Savings & Trust Company, for $14,500.

Dividends Declared

Asheville Power & Light Company, Asheville, N. C., quarterly, 1¾ per cent, preferred.

Birmingham Railway, Light & Power Company, Birmingham, Ala., 3 per cent, preferred; 1 per cent, common.

Carolina Power & Light Company, Raleigh, N. C., quarterly, 1¾ per cent, preferred.

Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly, 1½ per cent, preferred, Series A.

Elmira Water, Light & Railroad Company, Elmira, N. Y., quarterly, 1¾ per cent, first preferred; quarterly, 1¼ per cent, second preferred.

Hestonville, Mantua & Fairmont Passenger Railway, $1.50, preferred; $1, common.

Interstate Railways, Camden, N. J., 30 cents, preferred.

Louisville (Ky.) Traction Company, quarterly, 1 per cent, common.

Ottawa (Ont.) Traction Company, quarterly, 1 per cent.

Philadelphia Company, Pittsburgh, Pa., quarterly, 87½ cents, common.

Tri-City Railway & Light Company, Davenport, Iowa, quarterly, 1 per cent, common.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., quarterly, 1½ per cent, preferred.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$70,632	*$41,137	$29,495	$18,841	$10,654
1 " "	'16	62,654	*35,266	27,388	17,697	9,691
12 " "	'17	860,144	*486,017	374,127	219,215	154,912
12 " "	'16	794,421	*420,172	374,249	212,875	161,374

BATON ROUGE (LA.) ELECTRIC COMPANY

1m., Apr.,	'17	$18,987	*$9,849	$9,138	$3,497	$5,641
1 " "	'16	15,746	*8,239	7,507	3,463	4,044
12 " "	'17	221,302	*104,042	117,260	42,246	75,014
12 " "	'16	198,865	*106,176	92,689	32,306	60,383

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Apr.,	'17	$8,783	*$9,768	†$985	$1,184	†$2,169
1 " "	'16	8,403	*8,258	145	1,096	†951
12 " "	'17	125,683	*115,708	9,975	13,533	†3,558
12 " "	'16	117,963	*98,444	19,519	13,370	6,149

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

1m., Apr.,	'17	$34,508	*$21,727	$12,781	$6,553	$6,228
1 " "	'16	28,234	*18,296	9,938	6,499	3,439
12 " "	'17	413,660	*240,547	173,113	78,606	94,507
12 " "	'16	374,920	*218,588	156,332	78,830	77,502

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Apr.,	'17	$111,840	*$77,929	$33,911	$29,649	$4,262
1 " "	'16	99,983	*60,498	39,485	29,671	9,814
12 " "	'17	1,260,774	*875,961	384,813	358,215	26,598
12 " "	'16	1,154,663	*739,473	415,190	357,734	57,456

COLUMBUS (GA.) ELECTRIC COMPANY

1m., Apr.,	'17	$83,716	*$29,751	$53,965	$28,242	$25,723
1 " "	'16	64,878	*27,249	37,629	28,653	8,976
12 " "	'17	955,333	*365,122	590,211	342,377	247,834
12 " "	'16	760,864	*330,277	430,587	344,103	86,484

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., Apr.,	'17	$304,819	*$222,485	$82,334	$44,938	$37,396
1 " "	'16	285,006	*170,754	114,252	42,875	71,377
12 " "	'17	3,677,280	*2,339,418	1,337,862	522,904	814,958
12 " "	'16	3,239,025	*1,910,247	1,328,778	493,146	835,632

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Apr.,	'17	$1,502,961	*$895,423	$607,538	$430,014	$177,524
1 " "	'16	1,313,207	*692,895	620,312	427,094	193,218
12 " "	'17	17,735,092	*10,142,214	7,592,878	5,087,199	2,505,679
12 " "	'16	15,411,384	*8,202,084	7,209,300	4,726,934	2,482,366

DALLAS (TEX.) ELECTRIC COMPANY

1m., Apr.,	'17	$172,927	*$108,683	$64,244	$40,680	$23,564
1 " "	'16	151,269	*96,674	54,595	36,597	‡19,998
12 " "	'17	2,083,501	*1,263,289	820,212	467,628	‡362,726
12 " "	'16	1,870,966	*1,152,216	718,750	417,656	‡310,294

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

1m., Apr.,	'17	$75,386	*$41,843	$33,543	$11,547	‡$23,493
1 " "	'16	62,995	*34,387	28,608	8,864	19,744
12 " "	'17	874,517	*469,944	404,573	113,185	‡292,884
12 " "	'16	773,901	*403,133	370,768	105,766	265,002

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Apr.,	'17	$298,279	*$185,584	$112,695	$64,945	$47,750
1 " "	'16	237,646	*141,270	96,376	62,648	33,728
12 " "	'17	3,247,423	*1,999,445	1,247,978	762,727	485,251
12 " "	'16	2,606,949	*1,553,933	1,053,016	755,424	297,592

EL PASO (TEX.) ELECTRIC COMPANY

1m., Apr.,	'17	$101,379	*$60,010	$41,369	$4,649	$36,720
1 " "	'16	85,799	*43,892	41,907	4,670	37,237
12 " "	'17	1,179,158	*729,649	449,509	60,573	388,936
12 " "	'16	1,023,938	*532,301	491,637	52,430	439,207

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

1m., Apr.,	'17	$150,698	*$106,371	$44,327	$37,295	$7,032
1 " "	'16	151,416	*102,096	49,320	36,579	12,741
12 " "	'17	1,952,355	*1,259,273	693,082	440,411	252,671
12 " "	'16	1,924,891	*1,224,641	700,250	435,388	264,862

GRAND RAPIDS (MICH.) RAILWAY

1m., Apr.,	'17	$103,025	*$72,419	$30,600	$18,187	$12,419
1 " "	'16	103,047	*67,256	35,791	13,700	22,091
12 " "	'17	1,310,473	*860,495	449,978	201,197	248,781
12 " "	'16	1,220,107	*829,735	390,372	167,166	223,206

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

1m., Apr.,	'17	$31,536	*$16,091	$15,445	$5,125	$10,320
1 " "	'16	27,765	*14,389	13,376	5,453	7,923
12 " "	'17	338,476	*196,272	142,204	62,621	79,583
12 " "	'16	298,288	*164,925	133,363	66,131	67,232

JACKSONVILLE (FLA.) TRACTION COMPANY

1m., Apr.,	'17	$58,675	*$38,495	$20,180	$15,754	$4,426
1 " "	'16	54,593	*34,645	19,948	15,439	4,509
12 " "	'17	647,964	*434,865	213,099	186,148	26,951
12 " "	'16	615,221	*424,264	190,957	179,363	11,594

KEOKUK (IOWA) ELECTRIC COMPANY

1m., Apr.,	'17	$19,403	*$13,374	$6,029	$2,162	$3,867
1 " "	'16	19,930	*12,780	7,150	1,944	5,206
12 " "	'17	239,430	*164,342	75,088	24,587	50,501
12 " "	'16	236,759	*149,756	87,003	22,365	64,638

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*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

I. C. C. Powers Questioned

Illinois Rate Dispute to Test Supremacy of Public Service or Interstate Commerce Commission Rulings

Neither President Wilson nor Attorney-General Gregory will interfere in the controversy between the United States and the State of Illinois in the rate dispute referred to in the ELECTRIC RAILWAY JOURNAL for June 16, page 1115. The dispute arose when the State refused to have its 2-cent passenger fare law disregarded in the Interstate Commerce Commission's order to the railroads to remove discrimination caused by the State rates. At a conference held recently in Washington the Attorney-General said he had nothing to do with the case. Chief Counsel Folk of the Interstate Commerce Commission, who is in charge of the litigation, was requested to ask the commission to postpone the effective date of the order as urged by Governor Lowden in a letter to the Illinois Senators in view of present national conditions. Inasmuch as the commission has previously considered the case in this light, it is doubtful whether the request will be granted.

The maximum passenger rate of 2 cents a mile in Illinois is fixed by a law which has been upheld in the State Supreme Court. The Interstate Commerce Commission ordered the discrimination caused by the difference in state and interstate rates removed, incidentally holding 2.4 cents a mile to be a reasonable passenger fare. The railroads chose to increase the State rates. Judge Landis of the Federal Court at Chicago dismissed the suit of the railroads to have the Illinois law set aside. Then action was taken in the Federal Court at St. Louis which resulted in an order to conform to the 2.4-cent rate. The Illinois authorities are fighting this order. Meanwhile the railroads are collecting the higher rate of fare which involves the violation of the ruling of the State Public Service Commission, which has held the 2.4-cent rate to be excessive. Individuals responsible for such violations are liable to imprisonment for not more than one year. State Attorney-General Brundage has begun proceedings to test the powers of the Interstate Commerce Commission, on the ground that it is exceeding its authority.

Kansas City Fare Hearing

Controversy Involves Fares to Suburban Districts—Zone System with 2-Cent Rate Is Suggested

The Public Service Commission of Missouri held hearings in Kansas City on June 11 and 12 on the subject of fares outside Kansas City on the lines of the Kansas City Railways. The case is so stated, because the property owners in the Maywood and Fairmount Park districts outside the city limits are contending that they are not suburban communities, that they do not receive suburban or interurban service and that the commission in considering the cost of service to their communities should not consider those lines separately but whether or not the system as a whole is paying. Almost the entire time of the hearings was consumed in determining the identity of conditions in the Maywood and Fairmount districts and other districts in Kansas City with reference to street car service. The company showed that it had lost $60,000 because of the commission's order that 5 cents should carry a passenger through Kansas City and to Maywood, a suburban station. The property owners responded that many other stretches of track of equal length within the city limits would show similar losses if their accounts were separated from the company's total business.

Under the commission's order the street railway has, since October, 1916, been carrying passengers to Maywood, 2 miles beyond the city limits, without extra fare. The order had been issued because the company was carrying passengers to Fairmount Park, the same distance as Maywood beyond the city limits, without extra fare. At the hearing it was expected that the railway company would urge the commission to adopt a basis of 2 cents a mile for fares outside the city limits. President Kealy, upon examination, said that the company would soon file an amendment to this proposal which, he intimated, would incorporate the zone idea.

An amusing phase of the hearing was the attempt of property owners outside the city to emphasize the obligation of the company to give suburban dwellers the same service and rates as obtain on the city lines in Kansas City, Mo., and Kansas City and Rosedale, Kan. The three cities are practically one. The suburban district involved in the controversy lies between Kansas City, Mo., and Independence, Mo. Under present conditions the company gives unlimited transfers and a 5-cent fare in the three cities, charges 5 cents extra on the Dodson line, a suburban line which was not represented by property owners at the hearing, and 5 cents extra to Independence, with round-trip tickets to Independence being sold for 15 cents including the city fare.

A complication depended upon by the contestants is that the State law prohibits a city of first class from expanding to within less than 3 miles of a county seat. Except for this law, they say, their district would long ago have been taken into Kansas City, Mo., since Independence, the county seat of Jackson County, is little more than 3 miles from the Kansas City limits. No decision was rendered by the board. Briefs will be filed and another hearing will be held at Jefferson City in thirty days.

Electric Lines Relieve Traffic

7,250,000 People In and Out of Indianapolis in 1916 Via Electric Interurban

In an address delivered before the Transportation Club of Indianapolis, Ind., recently, E. B. Peck, vice-president of the Indianapolis Traction & Terminal Company, emphasized the importance of the members of the club lending their influence toward the granting of a legitimate fare increase to compensate for the greatly increased operating costs, instead of opposing such increases before the regulatory commission. He pointed out that if such increases were successfully opposed and continuously, that it meant government ownership as an inevitable end, and that the shippers would then be forced to pay the increased cost through taxes, which would be augmented by inefficient operation.

The immense volume of traffic that is handled at the Indianapolis terminal was shown in tabular form in the ELECTRIC RAILWAY JOURNAL for Feb. 17, page 321. Speaking of the importance of Indianapolis as an electric railway center, Mr. Peck said that 254,029 passenger trains arrived and departed from the local passenger and freight terminal during 1916—an average of 694 trains daily. He stated that the electric railways had done much to relieve the local freight congestion and that this was best evidenced by the fact that 25,980 freight trains arrived and departed from the terminal in 1916, or an average of seventy-one a day. Speaking further on the relation of this traffic to the steam roads, he said:

"From the viewpoint of the steam road official this traffic is termed local, applying to both passenger and freight. What this local traffic has meant to the city of Indianapolis is best shown by the fact that in 1916 these electric railways delivered to this terminal and transported from it 7,250,000 people, an average of about 20,000 a day. Every four months this is an equivalent of the entire population of the State. These electric railways are handling through the Indianapolis terminal approximately 200,000 tons of freight annually. What would be the sintuation if the steam railways had this additional traffic to take care of under the present conditions? This traffic, both passenger and freight, has not been taken away from the steam roads entirely, and being what is termed 'local' has relieved the steam roads to that extent, giving them that much additional facilities for handling the heavy through traffic. Instead, the traffic handled by the electric railways has been very largely developed by them and not taken from the steam roads."

Mr. McCulloch Reviews Conditions

In a signed article which appears in the issue of the *United Railways Bulletin* for June 15, published by the United Railways, St. Louis, Mo., Richard McCulloch, president of the company, makes a plea for an increase in street car fares, which he says is absolutely necessary. He points out that expense of operation is from 40 to 135 per cent greater now than it was in 1912. He claims that street railways can no longer operate on a 5-cent fare and realize a profit. Mr. McCulloch's statement was, in part, as follows:

"The popularity of the cheaper varieties of automobiles has robbed us of much of the Saturday afternoon and Sunday business. The constantly increasing use of transfers produces a rapidly diminishing average rate of fare. Although the nominal fare is 5 cents; the actual fare per ride last year was 3.22 cents.

"On the present basis, if 5 cents was a reasonable fare in 1912, it should be 10 cents at the present time. The 5-cent fare was adopted in horse-car days, when the average haul was perhaps one-half what it is now, when the price of labor was one-half the present price, and when materials were much cheaper. The free transfer was adopted in the early days of the electric railway, when the promoters had rosy views as to the prosperous future of the business. These views, it is needless to say, have not materialized.

"It is difficult to see how the business continues to exist on a 5-cent fare. Unless the fares are adjusted, street railways cannot continue as private investments. If they should become municipal investments, the municipality must then make up the deficit."

Seattle Seeks Jitney Regulation

A bill has been submitted to the City Council of Seattle by Councilman C. B. Fitzgerald in an effort to bring the "donation buses" and "private carriers for hire" under the jurisdiction of the city. The ordinance provides that any donation bus or private carrier shall deposit an insurance policy for $2,500 issued by a company authorized to do business in the State. The policies, it is said, might be issued by the jitney men's mutual company, as it is licensed to sell liability but not surety bonds. It is not yet determined whether the bonds of the Mutual Union Insurance Company will be acceptable. The Supreme Court at Olympia on June 8 heard the case started by the jitney men to compel the State Insurance Commissioner to issue to the Mutual Insurance Company a certificate to write surety bonds. The case was taken under advisement. William R. Crawford, attorney for the jitney drivers, submitted his views on the subject of city regulation, and the bill as drafted meets with his approval.

Improvements Made in Buffalo

Upon the recommendation of the municipal traffic commission which has been studying street railway traffic problems in the downtown section of Buffalo, N. Y., the City Council has granted the International Railway permission to lay a single track around the Soldiers' Monument in Lafayette Square. The asphalt space between the monument and the safety zone at Main Street will be enlarged under the supervision of the department of public works and the park department. This work will be done at once but owing to the condition in the steel trade the tracks cannot be laid until fall. By routing the Broadway cars around Lafayette Square instead of down Washington Street between Broadway and South Division Street the commission believes that the present congestion in Washington Street can be relieved by at least 50 per cent.

Other recommendations which will be considered by officials of the International Railway are the construction of additional loading tracks in Shelton Square for the Niagara and Grant Street lines and the construction of a frame shelter house over the safety zone at that point. The city has already established its first safety zone at Main and Eagle Streets, in the heart of the downtown business district and lines have been painted upon the street to indicate where cars may stop to discharge and take on passengers.

The City Council has approved the recommendation of the traffic commission that the skip-stop system be tried on the Main Street and Elmwood Avenue lines. For some time President E. G. Connette and J. O. Weigel, general superintendent of transportation, have been considering the trial of the skip stop but the company has not announced officially what will be done. Thomas Penney, vice-president of the company, declared before the City Council at the time the company received permission to lay a single track around the Soldiers' Monument that the company is willing to co-operate with the commission and the city authorities in any way that will contribute toward better service.

Advertisements on Transfers in St. Louis.—After July 1 the United Railways, St. Louis, Mo., will have printed in two colors on the back of transfers for some of the lines attractive advertisements calling attention to points of interest to the visitor in the city.

Schenectady Fare Increase Again Suspended.—The Public Service Commission for the Second District of New York on June 14 again suspended the proposed increases in fares on the lines of the Schenectady (N. Y.) Railway. The new period of suspension is from June 15 to Aug. 15. The effective date of these changes was originally set for Feb. 16.

Buffalo Survey Finished.—Charles R. Barnes, electric railway inspector for the Public Service Commission of the Second District of New York, who has been making a survey of conditions on the local lines of the International Railway, Buffalo, N. Y., has completed his report. It is expected that the commission's recommendations will be made public within the next three or four weeks.

Texas Jitneys Abandon Service.—The increasing expense of operation has cut into the profits of the jitneys in Texas so that many are discontinuing their service. In Houston there are now twelve vacancies. The Houston jitney ordinance authorizes the City Commission to designate the number of jitneys that can operate on any street. In Dallas, where jitneys are now running without restriction, save such as is imposed by the traffic ordinances, there is even a greater decrease in the number of jitneys. There have been as many as 400 jitneys in operation at one time, whereas now, it is said, there are less than 250.

Railway Men Witness One-Man Car Operation.—Representatives of street car interests and citizens of Waterloo, Iowa, have been investigating the operation of one-man cars in Fort Worth, Tex., with a view to determining the feasibility of introducing such service at Waterloo. Mayor Low of Waterloo visited Fort Worth last January, and he was followed by a delegation of street railway representatives from the Iowa city. The one man car as operated in Fort Worth by the Northern Texas Traction Company, a Stone & Webster property, was carefully investigated. A delegation of citizens has just made another investigation and action at Waterloo will be taken on its recommendations.

Commission to Consider Fare Increase Jointly.—The New York & North Shore Traction Company, Roslyn, N. Y., noted in the ELECTRIC RAILWAY JOURNAL for June 16, page 1117, as wanting to increase its fares from 5 cents to 7 cents, has applied to the Public Service Commissions for the First and Second Districts of New York for permission to make such changes in its rates. The company operates trolley lines from Flushing to the New York City line at Little Neck, with an extension from Murray Hill, Flushing, to Whitestone, within the City of New York, and additional lines in Nassau County. The application to the First District Commission is being considered in connection with those of several other railway companies asking authority to charge 2 cents for transfers.

Louisville Proposes Traffic Rules.—The municipal committee of the Board of Trade of Louisville, Ky., has been directed by the board of directors to take up with the city authorities and with other organizations of the city the matter of passing an ordinance which will prohibit pedestrians from crossing the streets between crossings. This action resulted, in part, from numerous serious accidents during the last few weeks. It was taken on motion of J. B. Wathen, Jr., a prominent distiller of the city. He immediately began to carry out the instructions of the directors of the Board of Trade, which, in addition to the provision regarding crossing streets in the middle of blocks, would prohibit sprinkling downtown streets as well as the use of glaring headlights by motorists.

San Diego Line to Reduce Service.—The Los Angeles & San Diego Beach Railway, San Diego, Cal., has filed with the Railroad Commission of California an application for authority to reduce its train service and increase its rates so as to meet operating expense. The application states that the company has never made any profit nor paid any dividend and that it cannot pay expenses under its present tariff and give its extensive train service. The percentage of operating expense to gross revenue in 1916 was 83.66, and for the past six months the operating expense has exceeded the receipts. The company further states that it has tried in every way to increase its business, but has failed; that its train service is too large for the patronage and that it will continue to lose money unless the commission comes to its aid.

International Railway Opens Lake Ontario Resort.—The International Railway, Buffalo, N. Y., has opened its Lake Ontario summer resort for the season. The first excursion to Olcott Beach on the Lockport & Olcott division was run on Decoration Day and a special reduced fare of 75 cents from Buffalo has been made effective for the season. A few days before the opening W. J. Whiteside, traffic agent of the company, invited newspapermen of Buffalo, Niagara Falls and Lockport to visit the resort as guests of the company. The trip was made in one of the company's private cars and a dinner was served at the Olcott Beach Hotel on the company's grounds. The company has received much newspaper publicity on the opening of the park and many excursions have been booked for Olcott Beach during the coming season.

New York Commission to Consider Freight Advance.—As noted in the ELECTRIC RAILWAY JOURNAL for May 12, page 894, the railroads of New York within the jurisdiction of the Public Service Commission for the Second District filed with the commission tariffs providing a 15 per cent increase in intrastate freight rates parallel with the increases in interstate rates for which they had asked the Interstate Commerce Commission. The commission has set a hearing on these applications for June 25. The Interstate Commerce Commission has finished its hearings on the interstate rates and will probably announce its decision within a short time. While the various State Commissions are of course not bound to accept the conclusion of the Federal body as necessarily to be followed in intrastate rates, it seems to have been generally believed that such a result would obtain except in particular cases where local conditions require a different determination, and this because the whole structure of interstate and intrastate rates is closely interwoven.

Army Camp Calls for Service. — The Louisville (Ky.) Railway will, no doubt, benefit greatly from additional service made necessary by the location of the federal army camp for the Ninth District near Louisville. The site selected for the camp is about 6 miles south of the central part of the city and is divided by one of the lines of the Louisville & Interurban Railroad, which is controlled by the Louisville Railway. It lies almost directly east of the terminus of the Highland Park line and is also within a very short distance from the terminus of one of the extensions of the Fourth Street city line. As soon as the selection of the site was made known, officials of the company began preparations to extend such lines as might be desirable. Final decision will wait until the camp is platted by the engineers, which will probably be in a few days. Construction work will then be pushed to completion. A double-track line will be provided to serve the camp and city service will be given at a 5-cent rate with transfers from the camp line to and from the city lines of the company. The schedule will be arranged to suit the requirements of the camp. A special effort will be made, it is stated, to get the steel early so that the Louisville & Interurban can do some of the freight hauling. It is estimated that materials for camp construction will run to approximately 25,000 carloads. The camp will be served also by two steam roads. No difficult construction will be necessary on any route.

Personal Mention

B. W. Arnold has been appointed manager of the Eastern Wisconsin Electric Company at Oshkosh, Wis.

Charles E. Buchner has been appointed secretary to Chairman Oscar S. Straus of the Public Service Commission of the First District of New York to succeed Godfrey Goldmark.

George D. Baxter, local manager of the Exeter & Hampton Electric Company, Exeter, N. H., has been made successor to J. A. MacAdams, who is manager and purchasing agent of the Exeter, Hampton & Amesburg Street Railway, in addition to his former duties. Mr. MacAdams will enter the engineering office of C. H. Tenney & Company, Boston, Mass.

Matthew C. Brush, president of the Boston (Mass.) Elevated Railway, is the subject of a very complimentary sketch in the June number of *The American Magazine*. The author of the article, Alfred Grunberg, has reviewed several instances in the life of Mr. Brush to portray his character which has made possible his rise from small beginnings and has placed him early in life at the head of one of the largest electric railways of the country.

A. G. Carson has been appointed manager of the Eastern Wisconsin Electric Company at Fond du Lac, Wis., in charge of the electric and gas departments there. Mr. Carson began his public service work with the Grand Rapids, Grand Haven & Muskegon Railway in the power and transportation departments. He later became chief engineer of the Winnebago Traction Company at Oshkosh, Wis., and when that company was consolidated with the Eastern Wisconsin Railway & Light Company he was sent to Fond du Lac as superintendent of the electric department. He has held that position for the last eight years, and a year ago was appointed superintendent of the gas department.

J. P. Pulliam has been appointed general manager of the Wisconsin Public Service Company, Green Bay, Wis. Vice-President C. R. Phenicie, who was also general manager until the appointment of Mr. Pulliam, will in the future give his entire time to his duties as vice-president, and will be engaged largely with construction and development work. Mr. Phenicie will retain his office in Green Bay and handle the affairs of the company in that vicinity jointly with Mr. Pulliam. The latter was formerly vice-president and general manager of the Wisconsin Electric Railway and general manager of the Eastern Wisconsin Railway & Light Company. A biographical sketch of Mr. Pulliam appeared in the ELECTRIC RAILWAY JOURNAL for March 17, page 524.

Godfrey Goldmark, secretary to Oscar S. Straus, chairman of the Public Service Commission for the First District of New York, has been appointed assistant counsel to the commission. Mr. Goldmark became Mr. Straus' private secretary in January, 1916, at which time he was a member of the firm of Steele, DeFriese & Steele. He was born in New York City thirty-five years ago. Upon his graduation from the Cornell Law School in 1902 he entered the office of Judge Steele and a year later became a junior partner. Since that time he has made a specialty of corporation law and has written works on this subject. He collaborated in the preparation of the seventh and eighth editions of "White on Corporations" and is one of the authors of "Non-Stock Corporations," by White and Goldmark.

William H. Wharton has been promoted to the position of superintendent of buildings of the Brooklyn (N. Y.) Rapid Transit Company, succeeding H. E. Funk. Mr. Wharton became identified with that company about nine years ago as time checker. After two and one-half years in that capacity he was made assistant supervisor of structure and has held that position until the present time. Mr. Wharton saw service in the Spanish-American War and subsequently was employed by the Westinghouse Agricultural Machine Works at Schenectady, N. Y. His work with that company involved considerable traveling and netted him much valuable experience. This together with unceasing efforts in the service of the Brooklyn Rapid Transit Company has fitted him eminently to take the position of his former chief.

George O. Nagle, who resigned in November, 1915, as second vice-president and general manager of the Wheeling (W. Va.) Traction Company, has been appointed city manager of Wheeling under the new city charter. Mr. Nagle was also formerly president and general manager of the Panhandle Traction Company and the Steubenville & Wheeling Traction Company, controlled by the Wheeling Traction Company. He was in charge of the city railway properties at Wheeling as general manager for twelve years. During that time the properties were extended and largely rebuilt. The appointment was unanimous and was made despite the fact that Mr. Nagle had announced that he would not accept the post. Later, however, he yielded to public opinion. Mr. Nagle has been engaged in railroad and electric railway work all his life, and the new work upon which he will enter will furnish him with an opportunity for studying the public utility question from a different viewpoint than he has had before. Upon his appointment to manage the railways at Wheeling Mr. Nagle promptly entered into all work for the community betterment, became an influential member of the Board of Trade, entered the Playground Association, and at the time of the Panama-Pacific Exposition was appointed by Governor Hatfield of West Virginia to represent the State as a member of the exposition commission. Mr. Nagle is at present president of the West Virginia Manufacturers' Association. A portrait and a biography of him were published in the ELECTRIC RAILWAY JOURNAL of Nov. 13, 1915.

H. E. Funk, heretofore superintendent of buildings of the Brooklyn (N. Y.) Rapid Transit Company, has been appointed engineer of rapid transit lines, a newly-created position. Mr. Funk has been in the service of that company for about twelve years. He is a native of Ohio and received part of his education at Oberlin College. Following a short connection as an engineer in the maintenance of way department of the Big Four Railroad at Galion, Ohio, he became employed by the Brooklyn Rapid Transit Company as track foreman in 1905. Two months later he was appointed assistant engineer in charge of construction and buildings and held that position until three years ago. At that time he was promoted to the position of superintendent of buildings, the office he has just relinquished. Mr. Funk has given unreservedly to the execution of his duties and as the demands upon the way and structure department require a special supervisor of the subway and elevated roads, he was very naturally chosen for the post.

H. E. FUNK

Obituary

W. O. Johnson, formerly receiver for the Chicago & Milwaukee Electric Railroad, died at his home in Chicago on June 10, at the age of sixty-one. Mr. Johnson was born at Fredonia, N. Y. He received his legal education at Hamilton College, and practiced law at Buffalo until 1882, when he went to Chicago as general counsel for the Erie Railroad. In 1906 he was elected president of the Security Life Insurance Company, and five years later was named receiver of the Chicago & Milwaukee Electric Railroad, now the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

Judson C. Clements, a member of the Interstate Commerce Commission for the last twenty-five years, died in Washington, D. C., on June 18, at the age of seventy-one Mr. Clements was a native of Georgia and a veteran of the Civil War. He was admitted to the bar in 1869 and immediately began to practice law in Lafayette, Ga. From 1872 to 1880 he served in the Georgia Legislature and was a member of Congress during the following eight years. In 1890 he was appointed special United States attorney to acquire titles for the government lands now occupied by Chickamauga Park and Chattanooga Military Park. Two years later President Harrison appointed him to membership on the Interstate Commerce Commission and on Jan. 13, 1911, he was elected chairman of that body.

Samuel J. Dill, vice-president of the United Gas & Electric Engineering Corporation, New York, died at his home in Jamaica, Long Island, on June 14. He was born in Wallkill, N. Y., Oct. 3, 1864. Mr. Dill had a remarkable career in public service work, and few men in the gas, electric and street railway fields have had a wider circle of friends. Early in life he was connected with the Pennsylvania, West Shore and the New York, New Haven & Hartford railroads, and later with the Staten Island Rapid Transit Company. Following a subsequent connection with the Metropolitan Street Railway, New York, he became superintendent of the Forty-second Street & Manhattanville Railroad. He held this position at the time the street railways of New York City abandoned the cable system and adopted electric traction. In 1901 Mr. Dill went to Ypsilanti, Mich., as general manager of the traction company there and later held similar positions in Kalamazoo, Mich., and Youngstown, Ohio. In 1908 he became associated with the Susquehanna Railway, Light & Power Company, entrusted with the management of the Elmira Water, Light & Railroad Company, one of its subsidiaries, and two years later he became vice-president and general manager of this property. From Elmira he was transferred to New York as assistant to the president of the Susquehanna Railway, Light & Power Company, and upon the consolidation of this company into the United Gas & Electric Corporation he was made vice-president, and also held the office of vice-president and a director of many of its subsidiary companies. Early in 1915 Mr. Dill went to New Orleans to assume charge of the work of the company in the South, and returned to New York about a year later. At the time of his death he held the position of vice-president of the United Gas & Electric Engineering Corporation, and during the past year he devoted all of his time to oil interests in Oklahoma.

John F. Calderwood, who resigned as vice-president and general manager of the Brooklyn (N. Y.) Rapid Transit Company on Jan. 1, 1914, owing to failing health, died at Long Lake, Minn., on June 14 at the age of fifty-eight. He had selected Minnesota for a residence after his retirement from railway service because for many years he had been a resident of that State, but he lived only three years to enjoy the life on the farm which he had purchased there. Mr. Calderwood entered the electric railway business from the accounting side and achieved his success as a manager largely through his ability to grasp quickly the lessons taught by accounting reports. He was born at Redford, near Detroit, Mich., on May 27, 1859, and soon after graduation at the University of Michigan became accountant and credit manager of a carpet concern in Minneapolis. In 1888 he was elected city comptroller, and at the close of the term accepted the office of comptroller of the Minneapolis Street Railway which, with the St. Paul City Railway, was afterward consolidated as the Twin City Rapid Transit Company. Previous to the purchase of the Third Avenue Railroad in New York by the Metropolitan Street Railway in 1900, Mr. Calderwood spent some time in the East at the request of the owners of the property with a view of its rehabilitation. The knowledge of electric railway finance and management displayed by him during this period, as well as his previous record, led to his appointment in 1902 with the Brooklyn Rapid Transit Company, first as assistant to the president and later as vice-president and general manager. When Mr. Calderwood went to Brooklyn he took charge of a system which was still loose jointed in many parts and operating with steam on the elevated lines and out-of-date cars on the surface lines. He left it as one of the most progressive electric railway organizations in the United States and paying dividends. Mr. Calderwood was one of the founders of the American Electric Railway Accountants' Association and one of its first presidents. During his connection with the Twin City Rapid Transit Company he was also a frequent contributor to the technical press on accounting topics, and at one time conducted a department in this paper on electric railway accounting, but he was compelled largely to discontinue this outside work after going to Brooklyn on account of the exactions of the work there.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Delaware & Maryland Traction, Light & Power Securities Company, Wilmington, Del.—Incorporated in Delaware to acquire railway properties and operate same. Capital stock, $5,000,000. Incorporators: DeArmond Lindes, R. Edward Ives and Charles A. Donnelly, all of Philadelphia. [June 9, '17.]

***Shoshone & Clearwater Railway, Marble, Idaho.**—Incorporated under the laws of Idaho to construct and operate a 33-mile railway to connect with the Chicago, Milwaukee & St. Paul Railroad at Marble. Fred Herrick, St. Maries, president.

***Flint & Great Lakes Railway, Flint, Mich.**—Incorporated to construct an electric railway between Crago from the Detroit United Railway tracks to the Buick factories in Flint. Capital stock, $100,000.

FRANCHISES

Eagle Rock, Cal.—The Glendale & Montrose Railroad has received a franchise from the City Council for the construction of a single-track line in the vicinity of its proposed station.

Modesto, Cal.—The Tidewater Southern Railway has asked the City Council for a franchise to construct a line along Ninth Street, up Nellie Street and thence across the canal. It is proposed to remove the present tracks of the company on N Street and Virginia Avenue.

St. Louis, Mo.—The United Railways Company of St. Louis has asked the Public Service Commission for permission to extend its Sarah Street line east from Sarah and Chouteau Avenue to Tiffany Street and south on Tiffany Street to Park Avenue. The completion of the Chouteau Avenue viaduct will give a direct connection from Park Avenue on the south to Florissant Avenue on the north, with transfers to all east and west-going lines.

Buffalo, N. Y.—The International Railway has received permission from the Public Service Commission for the Second District of New York to extend its Elmwood Avenue line from Hertel Avenue to the city line and also to extend its Franklin Street line between Chippewa Street and Allen Street.

Cleveland, Ohio.—The Cleveland Railway has received a franchise from the Village Council of Cleveland Heights to construct a double-track line from the Cedar Avenue S. E. terminal near East Boulevard along Cedar Avenue to Lee Road.

Columbus, Ohio.—After a series of conferences the County Commissioners of Franklin County and officials of the Columbus Railway, Power & Light Company came to an agreement on the franchise for the Westerville line on June 12 which, with a few minor exceptions, is in accordance with the first proposal of the company. The franchise as accepted calls for a twenty-five-year grant. The conditions of the franchise are referred to on page 1156 of this issue.

Pawtucket, R. I.—The Pawtucket Street Railway, operated by the Rhode Island Company, has received a franchise from the Board of Aldermen to relocate and lay rails in Broadway, School and Main Streets, Pawtucket.

TRACK AND ROADWAY

Mobile & Pensacola Railway & Navigation Company, Volanta, Ala.—This company, which has taken over the Mobile, Volanta & Pensacola Railroad, reports that 10 miles of track have been laid and contracts have been practically closed for the construction of the remainder of 35 miles between Volanta and Pensacola and for the erection of bridges.

Pacific Electric Railway, Los Angeles, Cal.—It is reported that the Pacific Electric Railway will construct an extension of its line from Santa Ana to Tustin.

San Diego (Cal.) Electric Railway.—Work on this company's extension to Balboa Park is being rushed to completion at a cost of about $120,000, and it is expected that the line will be placed in operation this month. The extension is 1½ miles long, rock ballasted, with 75-lb. rail inside the park and 114-lb. rail outside the park. Three steel bridges were required in the extension.

San Diego & South Eastern Railway, San Diego, Cal.—Work will soon be begun by the San Diego & South Eastern Railway on the construction of an extension from Santee to Lakeside, about 2 miles.

Waycross Street & Suburban Railway, Waycross, Ga.—It is reported that efforts will be made to improve and operate the line of the Waycross Street & Suburban Railway recently sold at receiver's sale.

Danville, Crescent & Kankakee Traction Company, Danville, Ill.—Plans are being made to revive the project of the Danville, Crescent & Kankakee Traction Company to construct a line from Danville to Kankakee. Practically all of the right-of-way has been secured. It extends northwest from Danville, through Potomac, Ellis, Rankin, Cissna Park and Crescent City to Kankakee. W. R. Nightingale, Crescent City, is reported interested. [April 4, '14.]

Murphysboro & Southern Illinois Railway, Murphysboro, Ill.—This company's new interurban line between Carbondale and Murphysboro is rapidly nearing completion, and it is hoped to operate the first car between those two towns on July 4. The bridge over the Big Muddy River is completed and cars from Murphysboro are now operating beyond that point. A. B. Minton, Murphysboro, president. [April 7, '17.]

Springfield (Ill.) Consolidated Railway.—This company is relaying about ¾ mile of double track on Peoria Road between Black Avenue and the State fair grounds.

***Goshen, Ind.**—It is reported that an interurban line may be constructed from Goshen to Kendallville, connecting with the Chicago, South Bend & Northern Indiana Railway at Goshen and with the Fort Wayne & Northwestern Railway at Kendallville.

Tri-City Railway, Davenport, Iowa.—This company has awarded a contract to the Central Engineering Company, Davenport, for grading its proposed line on Rock Island arsenal island.

Keokuk (Iowa) Electric Company.—This company will reconstruct its trolley and power transmission line between Hamilton and Warsaw, 5 miles. New poles and equipment have been ordered for this work, which will begin as soon as the new transmission line to Montrose is completed. The old wires will be restrung on new poles.

***Lafflet Electric Railway, Pella, Iowa.**—It is reported that D. S. Umbenhauer, 932 Park Street, Pella, is interested in the construction of a proposed electric railway in connection with the Wabash Railroad.

***Treynor, Iowa.**—Plans are being made to construct an electric railway from Neoga to Treynor, using the old right-of-way of the Iowa & Omaha Short Line. The new line will be built along one side of the right-of-way, leaving the balance for use as a public highway by the county. It is stated that no work will be done on the line this year, owing to the unsettled conditions of the markets for railroad material. E. A. Wickham, Council Bluffs, is interested.

New Orleans, La.—Plans are being made by the Elysian Fields Avenue Commission to renew the campaign for an electric line from New Orleans to Milneburg. Louis H. Burns, New Orleans, is interested. [Feb. 17, '17.]

Boston (Mass.) Elevated Railway.—A contract has been awarded by the Boston Elevated Railway to the Union Switch & Signal Company for signal apparatus to be installed in the Dorchester subway extension of the East Boston subway. The apparatus will include double impedance bond layouts, track transformers, automatic train stops, style L three-lens light signals and U. S. & S. model 15, vane-type, two-position track relays.

United Railways & Electric Company, Baltimore, Md.—This company contemplates the construction of an extension from Stone House Cove to Wagner's Point, about 1 mile.

Duluth (Minn.) Street Railway.—D. H. Clough & Company, Duluth, has received the contract for grading this company's proposed extension on Farrell Road.

West Jersey & Seashore Railroad, Camden, N. J.—Work has been begun by this company elevating its tracks in Westville over Timber Creek.

Salem & Pennsgrove Traction Company, Pennsgrove, N. J.—The Salem County Board of Freeholders has decided to postpone indefinitely further consideration of joining with the Salem & Pennsgrove Traction Company in building a temporary bridge across Salem Creek at Salem, for use of the trolley line. The freeholders were asked to pay $8,000 of the total cost of the structure, but thought that the trolley corporation would receive the greatest benefit instead of the public. Passengers must now walk across the bridge to make connections on the line between Salem and Pennsgrove.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York will receive bids on July 5 for the construction of Route No. 49, Section 3, the Culver Rapid Transit Railroad in Brooklyn, from a point near Avenue X to Sheepshead Bay Road. Bids are asked on three forms of contract, one calling for the furnishing of all steel and the erection of the same together with the incidental necessary construction. Of the remaining two forms one calls only for the furnishing of the necessary steel, about 3900 tons, and the other for the erection of steel and the furnishing of the necessary materials and labor. The Culver Rapid Transit Railroad is one of the so-called South Brooklyn lines which is being rebuilt as a city-owned elevated railroad.

International Railway, Buffalo, N. Y.—Completion of the new electric line being built between Buffalo and Niagara Falls by the International Railway may be delayed by a movement which has been started in North Tonawanda which may force the company to elevate its tracks all of the way through this city. One track has been laid between Buffalo and Niagara Falls and double tracks have been laid at many points along the line. The track elevation through Tonawanda and North Tonawanda begins about a half mile south of Tonawanda and continues to a point south of the Payne Avenue crossing of the present Buffalo-Niagara Falls line. Payne Avenue and other important streets and roads in North Tonawanda are crossed at grade. Residents of Gratwick in the north end of North Tonawanda have appealed to the municipal authorities to stop further construction of the line at grade through the city. An appeal will be made to the Public Service Commission. It is charged that the operation of high-speed steel cars through North Tonawanda at grade would be dangerous to traffic along the roads.

Western New York & Pennsylvania Traction Company, Olean, N. Y.—Work will soon be begun by this company on the construction of new track on West State Street.

Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y.—A certificate filed with the Secretary of State sets forth that the corporate name of the Poughkeepsie City & Wappingers Falls Electric Railway has been changed to the Poughkeepsie & Wappingers Falls Railway Company.

Rhode Island Company, Providence, R. I.—Work will soon be begun by the Rhode Island Company on the reconstruction of its tracks in Wakefield.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—Owing to franchise restrictions which the city of Berea tried to enforce, the Cleveland, Southwestern & Columbus Railway has built a 3-mile line around Berea and is now operating over the new line.

Port Jervis & Delaware Valley Railroad, Matamoras, Pa.—Although considerable money has been paid on stock, the project to build an electric railway from Milford, Pa., to Port Jervis, N. Y., has fallen through. The money will be paid back to the subscribers by the trustees with 3 per cent interest from Nov. 1, 1916, to May 1, 1917. The J. A. Vandergrift Company, Philadelphia, had the contract to build the road. [July 8, '16.]

Schenectady (N. Y.) Railway.—Work will be begun about July 1 by the Schenectady Railway on the double-tracking of its line on Rugby Road from Wendell Avenue to East Alley. The cost of the improvement is estimated at $17,000.

Dallas (Tex.) Southwestern Traction Company.—F. A. Kadane and George Kadane, president and superintendent, respectively of the Creek Construction Company, of Sapulpa, Okla., to which has been awarded the contract for the construction of the interurban line of the Dallas Southwestern Traction Company, between Dallas and Cleburne, have been elected directors of the Dallas Southwestern Traction Company. [June 16, '17.]

Texas Electric & Power Company, San Angelo, Tex.—Work will be begun immediately by the Texas Electric & Power Company on the construction of its proposed line from San Angelo to Winters, via Harriett, Miles, Rowena, Ballinger and Hatchell. Charles W. Hobbs, San Angelo, president. [April 28, '17.]

Saltair, Garfield & Western Railroad, Salt Lake City, Utah.—Work is in progress on the electrification of the Saltair, Garfield & Western Railroad, and it is stated that orders for considerable new material and equipment have been placed. H. A. Strauss, electrical engineer of Chicago, is in charge of the electrification. It is stated that electric cars will be operating to Saltair Beach within the next three months.

Petersburg & Appomattox Electric Railway, Petersburg, Va.—Work will be begun at once by this company double-tracking its line to the camp site at Lakemont.

Morgantown & Wheeling Railway, Morgantown, W. Va.—A report from this company states that it will construct 8 miles of new track.

SHOPS AND BUILDINGS

Boston & Worcester Street Railway, Boston, Mass.—This company has awarded a contract to Thomas P. Hurley for the construction of a freight station on Mechanic Street, Marlboro.

International Railway, Buffalo, N. Y.—This company has opened its new passenger terminal at Lockport, N. Y. The new building is of brick construction and replaces a frame terminal which has been in use for thirty-five years.

New York (N. Y.) Railways.—The rumor has been revived at this time that plans are being made for the construction of a new amusement building to occupy the site of the carhouse of the New York Railways on Eighth Avenue between Forty-eighth and Forty-ninth Streets. It is stated that the lease for the property has been drawn on a basis of twenty-one years' rental with renewal privileges.

Nipissing Central Railway, North Cobalt, Ont.—Bids are being asked by the Nipissing Central Railway for the reconstruction of its carhouse recently destroyed by fire.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—This company is erecting a storehouse 40 ft. x 110 ft., of brick and steel, on its property near the State fair park.

POWER HOUSES AND SUBSTATIONS

Norfolk & Bristol Street Railway, Foxboro, Mass.—This company reports that it expects to purchase one condenser pump.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—Plans have been filed by the Wilmington & Philadelphia Traction Company for the construction of an addition to its power plant on the Brandywine River.

Georgia Railway & Power Company, Atlanta, Ga.—This company will construct a 38,000-volt transmission line from its Dunlap plant on the Chattahoochee River, 3 miles from Gainesville, to the Pacolet and Gainesville cotton mills and furnish about 6000 hp. for their operation.

Interstate Electric Company, San Angelo, Tex.—This company will construct an electric transmission line to Paint Rock.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—Work has been begun by the Milwaukee Electric Railway & Light Company on the construction of a $1,000,000 power house on the shore of Lake Michigan in the suburbs of Milwaukee.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Purchasing Agent Should Be Shock Absorbers for Department Heads

The Salesman Would Have Less Difficulty in Obtaining Information from Technical Men of Railways if He Were a Technical Man Himself

BY ERNEST E. STIGALL
Purchasing Agent Kansas City Railways Company

It is difficult to say to what extent the general overhead cost chargeable to some particular article in manufacture would be reduced by showing 10, 25 or 50 per cent reduction in the expense of the sales force, as discussed by W. McK. White, in the issue of the ELECTRIC RAILWAY JOURNAL for June 2, page 1031. It is possible, however, to show very clearly the attitude of our company toward new material or equipment submitted for consideration and purchase.

We watch eagerly at all times for an opportunity to reduce our costs or to increase the safety or convenience of operation by new methods, new equipment, etc., which may be offered. On account of this policy, the company has for several years been represented by eight or ten officials at each annual convention, and has supplied each department with from one to a dozen copies of the ELECTRIC RAILWAY JOURNAL, which naturally stimulates interest and furnishes information relating to possible changes in equipment and supplies.

MANY TESTS BEING MADE ON EQUIPMENT

In addition to this, we are of course constantly studying and experimenting in our own plant and are in a position to consider new material or equipment submitted by manufacturers' representatives. The policy prevailing here in connection with new material or equipment is simply to reject such of these as the technical men in the department concerned may decide would not improve our present conditions, even though the material tested out to be all that was claimed for it. On the other hand, if the service results claimed for such equipment or material would improve present conditions, and we have reason to believe the performance under test would come up to the claims set forth, arrangements are immediately made for a complete service test.

By following this plan, we escape loading down our system with the details of a testing laboratory when there is nothing to be gained, and we do not lose the opportunity for a constant improvement of our property because of rejecting material which might prove valuable if adopted as a new standard simply because of red tape or a stone wall between ourselves and the manufacturer. We naturally avoid the practice of buying new material merely for the purpose of changing our purchases from Smith to Brown, etc.

Again referring to the article mentioned, it is our suggestion that the representative of the manufacturer would not have difficulty in obtaining information from the technical man of a street railway company, if the representative were a technical man himself. Obviously, little can be accomplished if a salesman equipped only with superlatives and assurances of 50 or 100 per cent saving, etc., is in conference with a practical operating man who wants actual, definite and complete information based on actual service performance. The engineer or mechanic is of course busy with the operation of the railway system, and it could very easily be that more than one-half of his time would be taken up by salesmen if he should permit this to be done. In my judgment it is the duty of the purchasing department to act as a sort of shock absorber to protect the different department heads from too many callers, just the same as the secretary to the executive of an organization would protect him.

When the purchasing department is in doubt regarding the advisability of a salesman calling directly upon the department head concerned, a special inquiry is made. If this department head believes it would be advantageous for him to go into the details of the material or equipment to be considered, then this is arranged for, but if the department head is already sufficiently informed so that he knows the subject under consideration would not improve his conditions, then the time of both the department head and the salesman are saved by this means. We do not believe there are many instances in which a recommendation to the president for purchase of certain materials for test would be refused approval. In my judgment the subject resolves itself into the question of conscientious service to the company, and a desire to show constant progress combined with a co-ordination through the proper organization, which will permit the company morale to obtain the proper results.

No Great Increase in Business Expected with Prices Soaring

"Spasmodic" Must Characterize Buying with Material Prices Continuing to Rise—Manufacturers Should Co-operate with Railways for Fare Increase

BY W. S. HAMMOND
Vice-President Consolidated Car Heating Company

Considering the conditions existing in the material market at the present time, the business offering is fully as good as can be expected. What the future prospects are is very difficult to prognosticate, on account of the constantly climbing prices in the material market. This naturally makes for higher prices right along, and with car equipment and supplies at the present prices, and with higher ones to come. it is difficult to see how there will be anything but spasmodic buying for immediate needs. Sales of buzzer equipments are good and thermostatic control and starting signal systems are in fair demand.

Recent articles in the JOURNAL have discussed the possibilities for fare increase on the electric railways. This is a most vital subject. The power which the manufacturers can exert in helping to secure increases in fares should be put into concrete form. My idea is that the Manufacturers' Association should outline a campaign which each member could push vigorously in his own community. It is highly important that the public should be educated to the difficulties confronting the railways, not only because of the increased cost of materials, but also because of the increased maintenance charges of both roadway and cars, increased platform expenses, taxes, etc. Such increases in operating cost cannot be offset entirely even by putting into effect the most rigid economies. The situation of electric railways in these respects is akin to that of the steam roads, but the former have even greater difficulties to surmount in attaining relief.

As far as better business prospects for the manufacturers are concerned, it is my idea that there will be no great increase in the volume of business as long as prices continue to increase, for managers cannot possibly feel justified in planning extensions and improvements under present conditions. There will of course be good orders here and there, placed because of sheer necessity. but our railway companies must be made more prosperous in order that they may extend and improve their systems, thus improving the outlook for themselves, for the manufacturers and for those whom they serve.

Electric Power Club Discusses Present Problems

Standardization, General Engineering Recommendations, Cost Accounting and Other Questions Affecting Service to the Nation Discussed

The eighth annual meeting of the Electric Power Club was held at the New Willard Hotel, Washington, D. C., on June 11 and 12. The program, which was given in the May 26 issue, was carried out practically as planned. In the absence of Howard E. Coffin, W. S. Gifford outlined the work of the Council of National Defense and Paymaster John M. Hancock, officer in charge of purchase division of the Bureau of Supplies and Accounts, Lieut. Alexander Sharp of the electrical division of the Bureau of Steam Engineering and Mr. Dean, electrical expert of the Bureau of Construction and Repair, spoke of the methods of these various navy departments in filling their electrical needs.

The chief topic of discussion of the whole meeting centered around the address of C. E. Patterson of the General Electric Company on uniform accounting. The accounting and cost system which is recommended for adoption by electrical manufacturers has the indorsement of the Electrical Manufacturers' Club, the Electric Power Club and the Associated Manufacturers of Electrical Supplies. It moreover bears the indorsement of the Federal Trade Commission. Another paper which proved very instructive was one read on the analysis of increased cost in manufacturing conditions during the past three years. This showed the upward trend of prices of all material used in the manufacture of motors. There was also an interesting discussion on the subject of national economy.

E. R. Harding, the president of the club, owing to the condition of his health tendered his resignation as president, and C. L. Collens, 2d, the vice-president, was elected in his stead. F. S. Hunting of Fort Wayne, Ind., was elected vice-president and T. E. Barnum of Milwaukee was elected to the board of governors. C. H. Roth of Chicago continues as secretary and treasurer. There were no other changes in the board of governors, which now consists of the president, vice-president, secretary and treasurer in addition to the following: James Burke, Burke Electric Company, Erie, Pa.; J. C. Hobart, Triumph Electric Company, Cincinnati, Ohio; J. R. Jeffrey, Allis-Chalmers Manufacturing Company, Milwaukee, Wis.; T. E. Barnum, Cutler-Hammer Manufacturing Company, Milwaukee, Wis.; W. A. Layman, Wagner Electric Manufacturing Company, St. Louis, Mo.; S. L. Nicholson, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; H. C. Petty, Crocker-Wheeler Company, Ampere, N. J., and R. J. Russell, Century Electric Company, St. Louis, Mo.

Government Books on Statistics

Compilation for 1916 of Foreign Trade Statistics and a New Book of Business and Commercial Statistics

Two new official books of statistics that should be helpful to all manufacturers, and particularly to those whose products have foreign sale, have just been announced by the Bureau of Foreign and Domestic commerce, through E. E. Pratt, chief of the bureau. The title, "Commerce and Navigation of the United States, 1916," describes a regular annual publication of this department. This book is well known among those who study foreign trade. It is the original and only official source of yearly trade statistics. The 1916 number, according to Dr. Pratt, is one of the most important that have ever been issued, because that year stands out in the history of the foreign trade development of the United States. This book contains 950 pages of statistical tables, and forty-one pages of summary tables giving foreign trade data in a most convenient form by articles, by countries and by customs. The price of this book is $1.50.

The "Statistical Abstract" for 1916 contains 771 pages of the latest available American and foreign statistics. This is a reference book covering the subject of agriculture, forestry and fisheries; manufacturing and mines; internal communication and transportation; merchant marine and shipping; foreign commerce; consumption estimates; prices, money, banking and insurance. There are also commercial, financial and monetary sattistics of the principal countries in the world. Copies of this book are to be distributed at the price of 50 cents to cover the cost of printing. Both books are obtainable by addressing the superintendent of documents, Washington, D. C., or writing to the nearest district or co-operative office of the Bureau of Foreign and Domestic Commerce.

Copper Market Conditions

Government Contractors Hesitate to Place Orders—Plans Made to Pool All Purchases for Our Government and Its Allies

The *Wire Message*, published by the Habirshaw Electric Cable Company, Inc., and the Electric Cable Company, in reviewing the present market conditions, says: "'Waiting' would well describe the condition of the copper market during the past month. One feature of uncertainty as to the government's position has apparently been removed: On May 23 an announcement was made in Washington that plans were being devised to pool all purchases for our government and its allies. Assuming this will be done, there still remains three important points to be determined, viz., price, quantity, and periods of delivery. It is to be hoped that some definite information on these points will soon be forthcoming, and the uncertainty which now prevails in the copper market removed. During the latter part of May copper showed decided signs of improvement, which to our mind is fully justified: The present demand for copper is enormous, and the future requirements of our government and its allies must run into huge figures. Exports of copper during this year are breaking all previous records.

"Production and demand must determine prices. It is evident that if production exceeds demand prices must go down. At present there is no evidence that this is the case; in fact, all evidence is to the contrary. It should be noted that factories with government orders have been uncertain whether the government would supply the copper. Naturally they have hesitated to buy heavily. We read in the *American Metal Market* of May 28 that one large manufacturer having a contract to supply the government with articles requiring a large quantity of copper, applied for assistance. The government replied it could lend no aid, and the manufacturer was forced to go into the market and cover his requirements the best he could."

New Westinghouse Officers

At the organization meeting of the directors of the Westinghouse Electric & Manufacturing Company, officers were re-elected, with the addition of three new vice-presidents, as follows: H. D. Shute, who has been treasurer of the company; H. T. Herr, who has been vice-president of the Westinghouse Machine Company, now merged with the parent company; and Walter Cary, who has been vice-president of the Westinghouse Lamp Company. H. F. Baetz succeeds Mr. Shute as treasurer and assistant secretary.

G. E. Gets Order for Big Turbine

The Public Service Electric Company, Newark, N. J., has just placed an order with the General Electric Company for a 30,000-kw., 13,200-volt, 60-cycle, three-phase turbo-generator. As noted in the ELECTRIC RAILWAY JOURNAL of June 9, page 1040, the Essex plant contains at present two General Electric 25,000-kva. units. In addition a 35,000-kw. unit of the same type is in process of installation and a 50,000-kva. unit is on order. This last order for a 30,000-kw. unit will, when installed, give this plant more than three-fourths of its ultimate capacity, which is 200,000 kw.

ROLLING STOCK

London (Ont.) Street Railway is reported to have purchased five city cars.

Olympia (Wash.) Light & Power Company is reported to be considering the purchase of one-man cars.

Michigan Railways, Jackson, Mich., has specified the following details for five vestibuled pay-within cars which are being built for the company by the St. Louis Car Company:

Number	5
Builder	St. Louis Car
Type	pay-within
Seating capacity	40
Weight (total)	26,840 lb.
Truck centers	19 ft. 0 in.
Over bumpers	41 ft. 4 in.
Over vestibules	40 ft. 4 in.
Over posts	8 ft. 2 in.
Floor to ceiling	7 ft. 6 in.
Sill to trolley base	8 ft. 5½ in.
Body	Steel sides with wooden superstructure
Interior trim	Honduras mahogany
Headlining	3/-16 in. Agasote
Roof	Turtle deck
Underframe	Steel
Air brakes	Westinghouse
Axles	St. Louis Car
Bumpers	Rico anti-climbers
Cables	St. Louis Car
Car trimmings	Bronze
Conduits	St. Louis Car
Curtain material	Pantasote No. 77
Curtain fixtures	Forsyth No. 88
Designation signs	Illuminated. E. S. S. Mechanism
Door mechanism	Hand-operated
Fenders	Ry. Co.'s design
Gongs	12 in. bronze pneumatic
Hand brakes	Ackley
Hand straps	Rico sanitary
Heaters	Peter Smith No. P-S
Headlights	Crouse-Hinds
Journal boxes	St. Louis Car
Paint	Murphy ABC
Registers	International R-5
Sand box	With Reliance trap valve
Sash fixtures	OMEdwards
Seats	St. Louis Car
Seating material	Rattan
Springs	Pittsburgh steel spring
Step treads	Mason
Trucks	St. Louis Car Co.'s 106-A max. traction
Ventilators	Automatic
Wheels	33-in. driver, 21-in. pony
Special devices	Faraday buzzers

Gary & Interurban Railroad, Gary, Ind., noted in the June 9 issue as having placed an order through Ford, Bacon & Davis for two motor and four trail cars, has specified the following details for this equipment.

Number	6
Date of order	May 28, 1917
Date of delivery	Oct. 1,1917
Builder	McGuire-Cummings
Type	Center-Entrance
Seating capacity	56
Weight (total)	38,000 lb.
Over bumpers	45 ft. 0 in.
Over vestibule	44 ft. 0 in.
Over all	8 ft. 6 in.
Rail to trolley base	11 ft. 0 in.
Body	All-steel
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Axles	Carbon steel
Bumpers	Rico anti-climber
Car trimmings	Bronze
Conduits	West.
Control	H. L. D.
Couplers	Tomlinson No. 8
Curtain fixtures	Curtain Supply No. 88 with "Rex All Metal" Rollers
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Nat'l Pneumatic
Fare boxes	International
Fenders	H. B. Lifeguards
Gears and pinions	West.
Hand brakes	"Horne" double-acting
Hand straps	Rico sanitary
Heaters	Gold Car Heating
Headlights	Crouse-Hinds L.L.A.
Journal boxes	McGuire-Cummings
Lightning arresters	West.
Motors	4 West. 514-A inside hung
Registers	International
Sanders	Ohio Brass Pneumatic
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn No.400-A
Seating material	Rattan
Springs	Coil and elliptic, McGuire-Cummings
Step treads	Universal "Anti-Slip Tread"
Trolley catchers	Knutson No. 5
Trolley base	U. S. No. 13-D.
Trolley wheels	West. groove
Trucks	Arch bar with equalizers
Ventilators	Railway Utility
Wheels	Griffin F.C.S. 26 in.
Special devices	Consolidated Car Heating buzzer system, Ellcon white enamel stanchions

Springfield (Ill.) Consolidated Street Railway has specified the details shown in the following table on seven pay-within cars which are being built for it by the St. Louis Car Company:

Number	7
Builder	St. Louis Car
Type	pay-within
Seating capacity	40
Weight (total)	26,840 lb.
Truck centers, length	19 ft. 0 in.
Length over vestibule	40 ft. 4 in.
Width over posts	8 ft. 2 in.
Floor to ceiling	7 ft. 6 in.
Sill to trolley base	8 ft. 5¼ in.
Body	Steel sides with wooden superstructure
Interior trim	Honduras mahogany
Headlining	3/16-in. Agasote
Roof	Turtle deck
Underframe	Steel
Air brakes	Westinghouse
Axles	St. Louis Car
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Cables	St. Louis Car
Control	K-36-J
Couplers	St. Louis Car
Curtain fixtures	Forsyth No. 88
Curtain material	Pantasote No. 77
Designation signs	Ill. E. S. S. Mechanism
Door mechanism	Hand operated
Fenders	Ry. Co.'s design
Gears and pinions	Nuttall
Gongs	12 in. bronze pneumatic
Hand brakes	Ackley
Hand straps	Rico sanitary
Heaters	Peter Smith No. P-2
Headlights	Crouse-Hinds
Journal boxes	St. Louis Car
Lightning arresters	West.
Motors	Two West. 532-B. outside hung
Paint	Murphy ABC
Registers	International R-5
Sand box	With Reliance trap valve
Sash fixtures	OMEdwards
Seats	Hale & Kilburn
Seating material	Rattan
Springs	Pittsburgh steel spring
Step treads	Mason
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trucks, type	St. Louis Car 106-A max. traction
Ventilators	Automatic
Wheels	33 in. driver, 21 in. pony cast-iron
Special devices	Faraday buzzers

NEW YORK METAL MARKET PRICES

	June 16	June 21
Prime Lake, cents per lb	32½	32½
Electrolytic, cents per lb	32½	32½
Copper wire base, cents per lb	36	36
Lead, cents per lb	11⅞	11¾
Nickel, cents per lb	50	50
Spelter, cents per lb	9¾	9¾
Tin, Straits, cents per lb	60⅝	63½
Aluminum, 98 to 99 per cent, cents per lb	61	61

OLD METAL PRICES

	June 16	June 21
Heavy copper, cents per lb	28	28½
Light copper, cents per lb	25½	25½
Red brass, cents per lb	17½	17½
Yellow brass, cents per lb	18	18
Lead, heavy, cents per lb	8¾	8¾
Zinc, cents per lb	7	7¼
Steel car axles, Chicago, per net ton	$48.00	$53.00
Old car wheels, Chicago, per gross ton	$36.00	$43.00
Steel rail (scrap), Chicago, per gross ton	$39.50	$48.50
Steel rail (relaying), Chicago, per gross ton	$42.50	$54.50
Machine shop turnings, Chicago, per net ton	$18.00	$19.50

CURRENT PRICES FOR MATERIALS

	June 16	June 21
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40.00	$40.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$4.00
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$4.00	$4.10
Steel bars, Pittsburgh, per 100 lb	$4.40	$4.50
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$7.35	$7.90
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$9.05	$9.30
I-beams over 15-in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.65
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.85
Cement (carload lots), New York, per bbl	$2.40	$2.40
Cement (carload lots), Chicago, per bbl	$2.31	$2.31
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.18
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.19
White lead (100 lb. keg), New York, cents per lb.	12¼	12¾
Turpentine (bbl. lots), New York, cents per gal.	44	43

TRADE NOTES

Frankel Connector Company, Inc., New York, N. Y., has moved its salesrooms to 1140-1146 Broadway.

Lawrence Grant has been appointed managing director and treasurer of the Eugene F. Phillips Electrical Works, Ltd., Montreal.

A. Press, consulting engineer and patent attorney, has changed his address from Norman, Okla., to 1777 Broadway, New York City.

Lincoln Electric Company, Cleveland, Ohio, announces that it has appointed the Ross Power Equipment Company, 617 Merchants' Bank Building, as its Indianapolis representative.

Francis C. Shenahon, for the last eight years dean of the College of Engineering of the University of Minnesota, has opened offices in the new Metropolitan Bank Building, Minneapolis, and will give his entire attention to his practice as a consulting hydraulic engineer.

Le Carbone Company, Paris, France, maker of Le Carbone carbon brushes for railway, lighting and power purposes, has just established a selling agency for South America with headquarters at Buenos Aires. This action, in view of the war conditions in France, is significant as a proof of the indomitable spirit and enterprise of this corporation. The North American sales of Le Carbone carbon brushes are being handled by W. J. Jeandron, New York.

Railway Improvement Company, New York, N. Y., announces that it has received the following orders for Rico sanitary hand straps: Eighty cars being built by The J. G. Brill Company for the United Railways & Electric Company, Baltimore, Md.; 100 cars being built by the Cincinnati Car Company for the Cincinnati Traction Company; four cars being built for the Toledo, Bowling Green & Southern Railway; eight cars being built for the Eastern Pennsylvania Railway; and fifteen cars being built for the Northern Texas Traction Company. It has also received orders for anti-climbers to be used on the cars being built for the Lewiston, Augusta & Waterville Street Railway and also for those of the Worcester Street Railway.

Stanley Motor Carriage Company, Newton, Mass., manufacturer of steam automobiles and railway cars, has been taken over by a new Delaware corporation of the same name. The new officers are: Prescott Warren, president; Carleton F. W. Stanley and Frank Jay, vice-presidents, and Edward M. Hallett, treasurer. They have all been associated with the company for twelve years. F. E. Stanley and F. O. Stanley, who founded the company in 1898, are now retiring.

Economy Fuse & Manufacturing Company, Chicago, Ill., through its president, A. L. Eustice, announces that every member of the organization, from the officers and directors to the newest office boy, has purchased one or more Liberty bonds. The employees, numbering more than 200, have subscribed a total of $80,000 worth of bonds through the company's selling plan, which is based on weekly payments proportioned to the wage or salary of the individual. In some cases the payments are as low as 25 cents a week. In addition, the company will pay the last $5 to the employee who remains with the company the required length of time. If an employee leaves the company before his subscription is entirely paid for, the money paid in will be refunded, together with 6 per cent interest.

Miller Trolley Shoe Company, South Boston, Mass., announces that the number of orders being received indicates the rapidly increasing popularity of this equipment on widely scattered properties. About 300 electric railways are now using these shoes. The New York, New Haven & Hartford Railroad has ordered enough shoes to equip twelve trains on its Nantucket Beach branch, as the result of favorable experience with this apparatus on the Providence-Fall River line of the company. Fifty shoes have been ordered within a few days by the Chicago, North Shore & Milwaukee Street Railway, and inquiries have been received from as far south as Brazil. A number of these shoes are in use in Cuba. In New England, the roads using this equipment are the Union Street Railway, New Bedford, Mass., six cars; Pittsfield Street Railway, ninety shoes; Cumberland County Power & Light Company, Portland, Me., twelve cars; Bangor Railway & Electric Company, two cars; Hartford and Bridgeport divisions of the Connecticut Company, ninety cars. Trial installations are also in service on the New Bedford & Onset Street Railway and the Massachusetts Northern Street Railway. The company is now bringing out an improved design of sliding shoe in which there are but thirteen parts, against twenty-one in the previous standard, and in which all bolts and nuts have been eliminated. This equipment will weigh about 5.25 lb., or about 1 lb. less than the ordinary 5-in. trolley wheel and harp. The company has recently moved into new quarters at 15 Elkins Street, South Boston.

NEW ADVERTISING LITERATURE

Portland Cement Association, Chicago, Ill.—A bulletin, "Concrete Tile for Land Drainage," illustrative and descriptive of types of concrete drain tiling.

Westinghouse Church Kerr & Company, New York, N. Y.—A reproduced blueprint of their mammoth Stirling boilers for the Detroit Edison Company. A large superimposed Simplex automobile shows by comparison the enormous size of furnace.

Combustible Engineering Company, New York, N. Y.: Bulletin B.2 on its type E stoker. It gives a number of cross-sections and elevations, and explains the detail operation of the stoker. Sections on distribution of air, automatic regulation, forced and natural draft, and smokeless operation are emphasized.

Wagner Electric Manufacturing Company, St. Louis, Mo.—A large calendar hanger on which the Wagner boy is shown with a model of the original plant built in 1889 in his hand, and comparing it with the present plant shown at the right. The dates of the present, past and succeeding months are given on the three pads and run from May 1, 1917, to June 30, 1918. Complete calendars for 1917, 1918 and 1919 are given on the hanger under the pads.

Lorain Steel Company, Johnstown, Pa.: Catalog No. 20, 259 pages. Deals with girder and high T-rails, slot rails, girder guard rails and other electric railway shapes; also gives the latest design of the company in special track work, including the "tadpole" type of tongue switch in manganese steel and guarantee construction, also various types of mates, frogs, and crossings. There is also a section on electrically welded joints which says that the electrical welding process is being applied not only to track in paved streets but to standard T-rail on exposed track. In such construction an expansion joint is used. The catalog is illustrated with handsome halftone sections of rails and other products of the company similar to those used in previous Lorain catalogs but brought up to date and including the latest sections.

New Publication

Electric Railway Transportation.* By Henry W. Blake, Editor ELECTRIC RAILWAY JOURNAL, and Walter Jackson, Business Manager, formerly Associate Editor, ELECTRIC RAILWAY JOURNAL, New York, N. Y. McGraw-Hill Book Company, Inc., New York, N. Y. 487 pages. Cloth, $5 net.

As the title implies, this book deals with the transportation methods and practices of electric railways. Very little relating to the work of electric railway transportation departments has been published in book form, and the authors of this volume have attempted to fill a gap in the literature of the industry. They state in their preface that they have devoted their efforts to making the information relating to their subject, contained in the Proceedings of the American Electric Railway Association and in the columns of the electric railway press, more readily available in book form, and to adding such comments of their own as may be of possible help to the man in the operating department. While the authors make no claim that the book is a complete compilation of the practices of all companies, many valuable operating data have been collated.

The first chapter, which deals with the various types of operating department organization, serves largely as an introduction. While not so divided by the authors, the subjects treated in the remaining eighteen chapters may be grouped under four heads, namely, relations between service and traffic, collection of revenue, promotion of traffic, and management of the transportation forces. Under the first heading the chapter titles (adjustment of service to traffic, accelerating traffic movement along the line, accelerating traffic movement on the car, car types in relation to traffic, city time-tables—preliminaries, and interurban schedules and dispatching) deal with such topics as standards of service, traffic counts and their analysis, car-demand curves, the rush hour and the problem of ameliorating rush-hour conditions, economy of higher speeds, the skip-stop, duration of stop, methods of speeding up car loading, effect of size of operating unit on traffic acceleration, car types and their relation to schedules, time-tables and time-table construction, and car dispatching.

The second group of chapters discuss the vital questions of fares and fare-collecting devices and practices. Among the topics treated may be mentioned, riding habit as determined by fare, metal tickets, transfers, reduced class rates, owl-car service rates, free riding for employees and others, fare zones, mileage and commutation books, passenger movement in fare collection, prepayment devices, traffic recorders, and conductors' reports.

The important question of public relations, promotion of passenger traffic, traffic signs, competition, and the freight and express business are the chapter headings of the third group. Courtesy first, service improvement bureaus, making change, co-operation with vehicle owners, public referendums, safety equipment, relations with the press, company publications, the motor bus, the jitney, and the various methods of promoting new business are among the topics which form the contents of these chapters.

The practices, with comments thereon, of a number of companies relative to the selection and training of men, wages and wage agreements, welfare work, discipline of trainmen, and forms of extra pay are set forth in the chapters dealing with the management of the operating forces.

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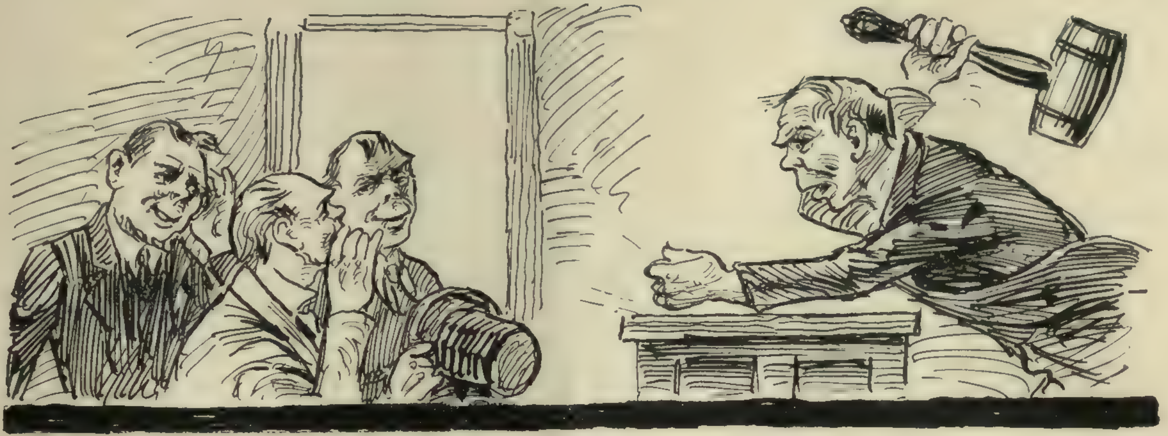
*Reviewed by D. D. Ewing, Associate Professor Electric Railway Engineering, Purdue University, Lafayette, Ind.



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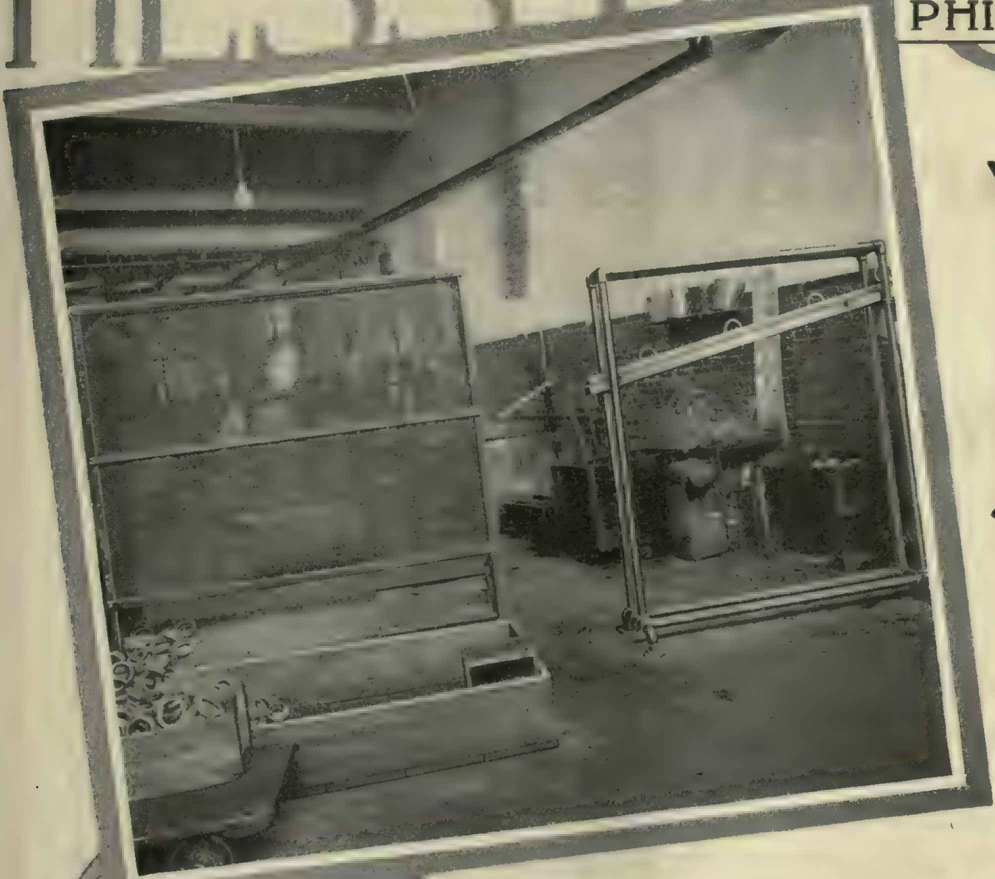

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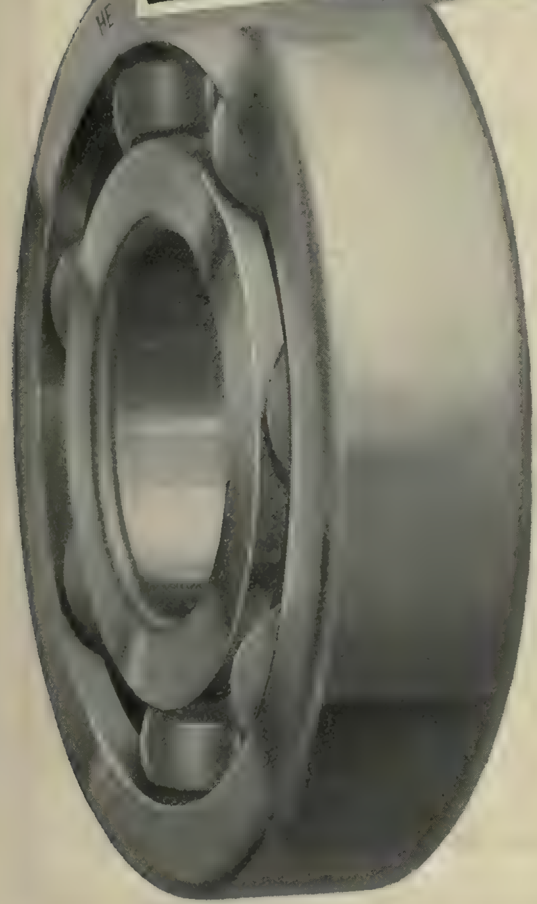

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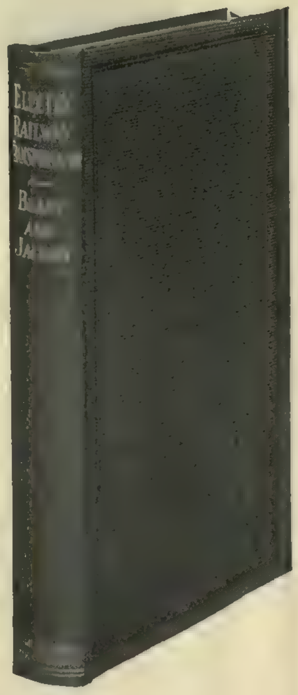

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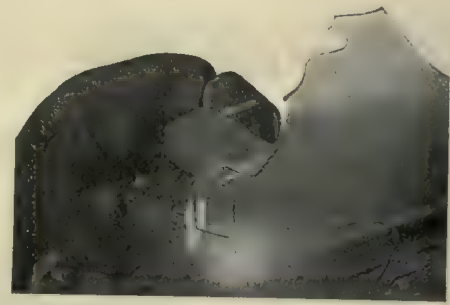

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The Lincoln Bonding System is the Application to Bonding Work of the One-Man Idea Plus Best Possible Equipment

The Lincoln one-man motor-generator set as applied for rail bonding assures—

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Economy—the natural result of one-man operation with equipment that can be handled so readily.

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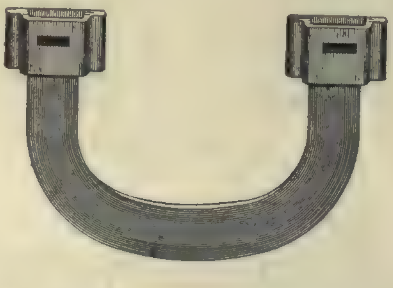
A true Integral Weld made in the shortest time at minimum cost and without resistance losses.



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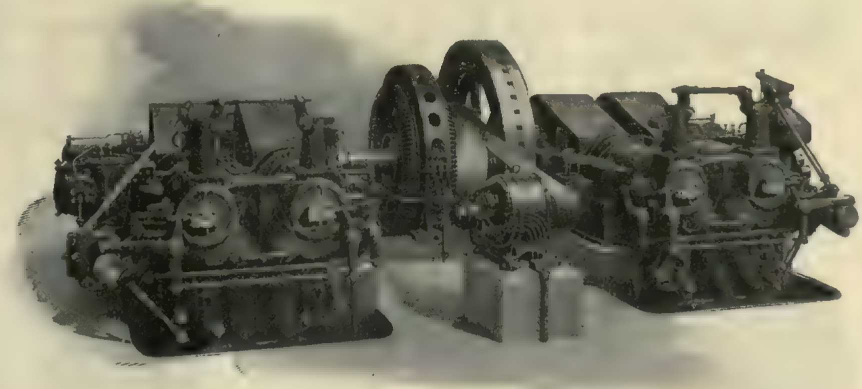

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Operates on any Crude Oil or Distillate Produced
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Extract from letter written by Chief Engineer of Pittsburgh & Conneaut Dock Company:—

> "Referring to the attached letter dated November 30th, regarding service of the Carnegie Steel Company's rolled steel wheels, wish to advise that our records show that we commenced using these wheels in 1911. Previous to that time we used rolled steel tires on cast iron centers, and the ordinary cast iron, chilled, double flanged wheel. We have found in our service, which I would class as **very severe,** that the rolled steel wheel has given us uniform satisfaction. These have proven superior to the rolled steel tire, on account of expense and durability. The failure of the rolled steel tire has been due to stretching, due to the rolling action, thereby loosening it from the cast iron center. We have had a great deal of difficulty with the chilled wheel, on account of its lack of uniformity in chill; the soft spots giving away under our excessive loads, which are in some cases as high as 55,000 lbs. under moving load. **The steel wheels have shown wonderful uniformity in density, and a great durability,** on account of strength of flange. We have worn the flanges very thin, but **in no case have we had a flange break,** which has been contrary to our experience with chilled wheels. I should consider it quite a hardship if we were obliged to go back to the cast iron chilled wheel, on account of the difficulties mentioned above."

Although the above letter was written in connection with Crane Track Wheels in heavy industrial service,

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give the same service on electric railways.

The mark of quality CARNEGIE It protects the user

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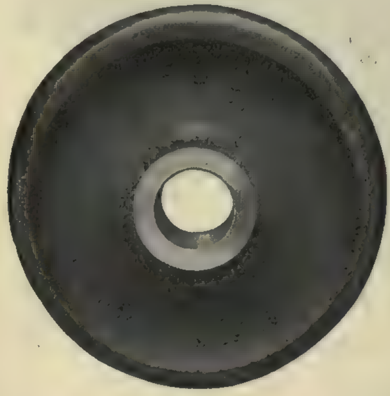

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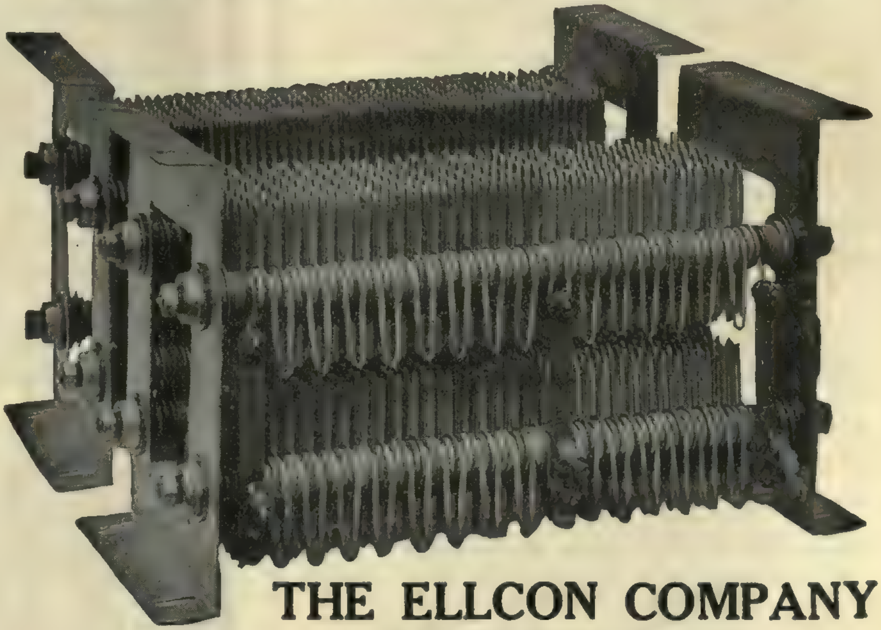

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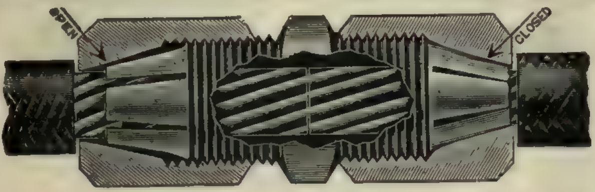

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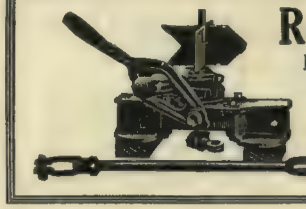

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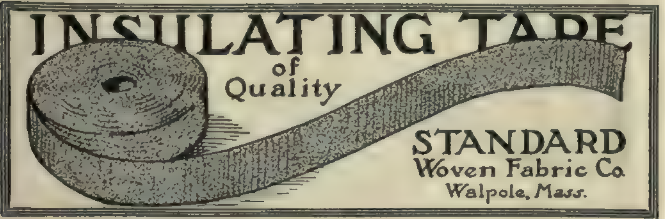

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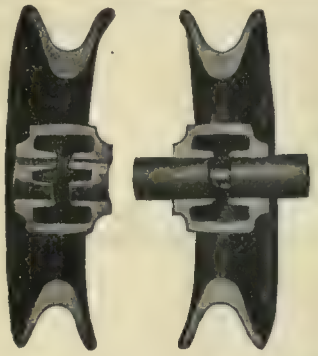

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operates directly from the line and always gets plenty of juice. No metal is exposed to the passenger's touch.

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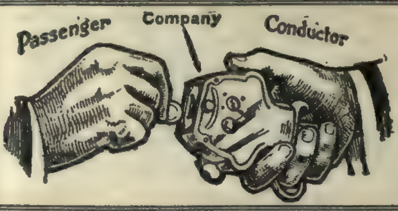

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The Kalamazoo Trolley Wheels

have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.

THE STAR BRASS WORKS
KALAMAZOO, MICH., U. S. A.

TROLLEY POLES

Our stock of over 7000 high carbon steel poles is at all times available for immediate shipment.

These poles are of high grade special skelp, properly reinforced, and will sustain a wheel pressure of from 35 to 40 pounds without taking a permanent bend.

NUTTALL
PITTSBURGH

The Baldwin Locomotive Works

Philadelphia, Pa.

ELECTRIC MOTOR and TRAILER TRUCKS

AMERICAN CARBON AND GRAPHITE MOTOR AND GENERATOR BRUSHES are selected according to operating conditions. We know brush material—you know your machine. Our combined knowledge will solve your brush problems.

AMERICAN CARBON & BATTERY CO. E. ST. LOUIS, ILL.

The Standard for Speed, Accuracy, Durability

B-V Visible Punch

Look for this
B-V.
Trade Mark

BONNEY-VEHSLAGE TOOL COMPANY
124 Chambers Street, New York City
Factory, Newark, N. J.

RAILWAY UTILITY COMPANY

Sole Manufacturers
"HONEYCOMB" AND "ROUND JET" VENTILATORS
for Monitor and Arch Roof Cars, and all classes of buildings; also
ELECTRIC THERMOMETER CONTROL
of Car Temperatures.

721 W. FULTON ST.
Chicago, Ill.

Write for Catalogue

1328 BROADWAY
New York, N. Y.

Use them in your terminals—
PEREY TURNSTILES or PASSIMETERS
Faster than the ticket seller
Perey Manufacturing Co., Inc.
30 Church Street, New York City

"GLOBE" VENTILATORS

An Efficient, Leakproof Ventilator at a reasonable price
Globe Ventilator Co., Troy, N.Y.

SEARCHLIGHT SECTION

IMMEDIATE SHIPMENT

1—500 K.W. Westinghouse Horizontal Turbo Generating Unit wound for 3 phase, 60 cycle, 2300 volts, speed 3600 rpm., condensing duty.

25 Cycle Rotary Converters

2—150 KW. General Electric type T.C., 4-150-750, 25 cycle, 3 ph., 575 volt, rotary converters, 750 rpm., complete with end play and speed limit device.

200 Kilowatt 60 Cycle Rotary Converters

1—200 KW. Westinghouse 3 ph., 60 cy. rotary converters, 550 volts, 720 rpm., complete with 4—100 KW. Westinghouse Scott connected oil insulated transformers, 10,000/9500 volts prim., 430/362 volts secy.
2—150 KW. Westinghouse 3 ph., 60 cy., rotary converters, 550 volts, 720 rpm.

Transformers

6—750 KVA. General Electric oil filled self cooled transformers, 4400/281 volts, with 4400-4290-4180-4070-2200-2090-1980 taps in the primary.
3—500 KW. General Electric, 60 cy., single phase transformers, 66,000 volts primary, 4400/2200 volts secondary.
3—375 KVA. Allis Chalmers O. I. S. C. indoor type transformers, 25 cy., 2300 v., 367 v. secy.
3—350 KVA. General Electric, type H, 60 cy., transformers 2400/2300/2200 v. prim., 200/400 v. secy.
1—100 KVA. General Electric, type H, 60 cy. transformer, 4600 volts prim., 115-230 volts secy.
3—100 KW. Wagner single phase, 60 cycle, 6600 volts primary, 2050/2300 volts secy., complete with oil.
4—100 KW. Westinghouse, oil insulated, Scott connected transformers, 10,000/9500 v. prim., 430/362 v. secy.
3—75 KW. Westinghouse 60 cy. transformers, 2200 v. prim., 110/220/440 v. secy.
3—50 KVA. General Electric type H, 60 cy. transformers, 900/1000/16000 v. prim. Y., 230/460 v. secy.
Also a stock of smaller sized transformers.

IMMEDIATE DELIVERY

ARCHER & BALDWIN, Inc.
114-118 Liberty Street New York City
TELEPHONE 4337-4338 RECTOR

Wanted

Forty Steel Wheels

Forged, Rolled or Cast

Within Forty Days

Diameter, twenty-six inches; tread, three inches wide; flange, seven-eighths inch high.

The Cincinnati Car Co.
Winton Place
Ohio

STREET CAR MOTORS

10 Westinghouse No. 306. PRACTICALLY NEW—LESS THAN ONE YEAR IN SERVICE.

12 Westinghouse No. 317-A, with gears and pinions. ABSOLUTELY NEW.

CONTROLLERS

38 Gen. Elec. K-10, with handles and brackets.

FREQUENCY CHANGERS

4 1000 KW. SETS:
  Generators: 3 ph., 60 cy., 4500-2300 volts, 300 RPM.
  Motors: 1050 Kva., 3 ph., 25 cy., 6600 volts, 300 RPM.
  Exciters: Direct connected.
  Switchboards: With necessary instruments.
1 100 KW. SET:
  Generator: Sgle. ph., 60 cycle, 2300 volts, 720 RPM.
  Motor: 150 HP., 3 ph., 25 cy., 2300 volts, 720 RPM.
  Exciter: 5 KW., direct connected.

ROTARY CONVERTERS AND MOTOR GENERATOR SETS—25 cycles

1 600 KW. Gen. Elec., TC-A, 3 ph., 600 volt, D.C., 375 volt A.C., 8 pole, 375 RPM.

1 600 KW. set consisting of two 300 KW. 6 pole generators, 550 volts, 600 amps., dir. conn. to one 750 HP. synchronous motor, 3 ph., 25 cy., 6600 volt, 500 RPM., complete with AC and DC panels.

4 500 KW. Gen. Elec., HC-K, 600 volt D.C., 4 pole, 750 RPM., each rotary complete with three 165 Kva. Gen. Elec. OI SC Transformers, HP-RP, 6600/5940 volts prim., 430/286/143 volts sec., also necessary panels and instruments.

1 500 KW. Westg., 3 ph., 550 volt D.C., 390 volt A.C., 6 pole, 500 RPM., with dir. conn. starting motor, AC and DC panels and three 175 KW. Westg. oil cooled transformers, 13,200 volts prim., 390 volts sec.

Our new and complete list of steam and electrical equipment will be mailed upon request

MACGOVERN & COMPANY, Inc.
114 Liberty Street, New York City

CARS FOR SALE

OPEN and CLOSED
MOTOR and TRAIL
Write for Price and Full Particulars to
ELECTRIC EQUIPMENT CO.
Commonwealth Bldg. Philadelphia, Pa.

It Would Be Almost a Miracle

if one or more of the 8,000 men who regularly receive the JOURNAL did not happen to want that used machine which you want to sell. The

Searchlight Section

brings buyers and sellers together

Copy received until Wednesday noon for publication in the issue of that week

SEARCHLIGHT SECTION

FOR SALE

Fare Boxes for Sale

40 Johnson registering fare boxes. In excellent operating condition. Greatly reduced prices. For immediate shipment address Nelson P. Hall, Sales Agency, 14 East Jackson Blvd., Chicago, Ill.

Immediate Shipment

100 tons of 62 lb. Shanghai rails, together with bars, rails practically as good as new, ready for quick shipment. Wire for prices.

M. K. FRANK
Frick Building, Pittsburgh, Pa.

If you want

New or Old Steel Rails
Machinery, Cars or Equipment
Write us your needs
Have you seen our new bargain list?

ZELNICKER IN ST. LOUIS

Railway Motors

FOR SALE

2 Westinghouse 49 railway motors, complete, with gears and pinions.

4 Westinghouse 38-B motors, complete, with gears and pinions.

Motors

WANTED

One 15 horse power and one 3 horse power, 500 volt D.C. motor.

The Beaver Valley Traction Co.
New Brighton, Pa.

Rail Joints

FOR SALE

3,000 pairs

Rail Joint Company's continuous rail joints for 5" 80 lb. A. S. C. E. Tee Rail, with horizontal drilling 3"-6" or 3"-9" respectively, from end of rail, vertical drilling 2 3/16" from base of rail, holes are drilled for ¾" track bolts.

Write Buffalo & Lake Erie Traction Company, Erie, Penna.

FOR SALE

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes.
Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
Park Bldg. Pittsburgh, Pa.

CLEVELAND ARMATURE WORKS
Cleveland, Ohio

Everything in the Line of Repairs to Electrical Machinery

Complete Armatures, New Armatures, Rewound Armature Cores, Armature Shafts, Armature Coils, Fields and Commutators.

Established 22 Years.

CARS

FOR SALE

Four closed pay-as-you-enter cars, Brill 27 G. E. trucks, equipped with four G. E. No. 80 motors. Air brakes, rattan seats, necessary accessories, in good operating condition, ready for immediate shipment.

May & Turner Company
Empire Building, Atlanta, Ga.

MISCELLANEOUS WANTS

Wanted at Once

For immediate shipment any quantity of battery lead plates, sediment scrap copper and wire, brass and all other grades of scrap material. Write to us today for our prices. National Metal & Rubber Co., 31 India Wharf, Boston, Mass.

Fare Boxes Wanted

Six second-hand Brill locked fare boxes. Must be good condition. W., 1533 (Miss.), Elec. Ry. Journal, Chicago.

WANTED

Electric Traveling Cranes

One 50-ton; two 20-ton; two 10-ton. State voltage, span, make, age and condition.

CARTER COAL COMPANY
First National Bank Bldg., Cincinnati, O.

POSITIONS WANTED

MAINTENANCE foreman, married, temperate, 35, experienced in all equipments, city and interurban, desires position as general foreman or master mechanic. References from past and present employers. P. W., 1525 (Ind.), Elec. Ry. Journal, Chicago.

MASTER mechanic with 18 years' experience on high speed interurban and city, wishes to change position. Entirely competent to handle property and help and get good results; not afraid of a tough proposition. P. W., 1521 (Conn.), Elec. Ry. Journal, N. Y. C.

SUBSTATION and overhead superintendent also experienced in shop work. Good interurban record, 18 years' experience, 10 years in last position. P. W., 1520 (Ill.), Elec. Ry. Journal, Chicago.

SUPERINTENDENT—Competent operating executive thoroughly conversant with modern practice. 20 years' experience in high-speed single track and city operation. Now employed, but desirous of assuming greater responsibilities. Correspondence solicited. P. W., 1535 (N. Y.), Elec. Ry. Journal, N. Y. C.

WOULD like position with street road in Southern State as master mechanic or general foreman, have had 16 years' experience, 10 years in one place and 4 years where now employed. Good on truck repairs and air brakes, expert on improving brakes, can do machine and blacksmith work, wind armatures, rebuild controllers and thoroughly understand electric equipment on cars. Well acquainted with G.E. and W.H. motors; now employed as master mechanic; will change for higher salary. P. W. 1537 (S. C.), Elec. Ry., Journal, Philadelphia.

POSITIONS VACANT

ARMATURE winder and electrician familiar with general maintenance and capable of taking charge of rolling stock, small road, twelve cars. Give experience and salary. Married man preferred. P., 1531 (Mich.), Elec. Ry. Journal, Chicago.

ALL-ROUND carbarn foreman wanted. Also all-round pitmen who must understand car equipment electrically as well as mechanically. P., 1534 (Mass.), Elec. Ry. Journal, N. Y. C.

BUYERS of right-of-way wanted for work in Middle West. State references and salary expected in first reply. Only experienced first-class high-grade men need apply. Republic Ry. & Light Co., Youngstown, Ohio.

EXPERT armature winder and electrician who is familiar with general maintenance and capable of taking charge of rolling stock of small road wanted. Give experience, references, salary, date can report, photo, and all other needed information in first letter. Address P. 1517 (Ill.), Elec. Ry. Journal, Chicago.

EMPLOYMENT AGENCIES

Correspondence Service

The undersigned provides a confidential service designed to locate openings through correspondence for men earning not less than $2,500 and up to $25,000; all lines. Not an employment agency, but a constructive, initiative service, covering individual negotiations. Established 1910. Complete privacy assured; present connections in no way jeopardized. Send name and address only for explanatory details. R. W. Bixby, H1 Niagara Square, Buffalo, N. Y.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

More than 300 different products are here listed.

The Alphabetical Index (see eighth page following) gives the page number of each advertisement.

As far as possible advertisements are so arranged that those relating to the same kind of equipment or apparatus will be found together.

This ready-reference index is up to date, changes being made each week.

If you don't find listed in these pages any product of which you desire the name of the maker, write or wire Electric Railway Journal, and we will probably furnish the information.

Acetylene Apparatus. (See Cutting Apparatus, Oxy-Acetylene.)

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Horne Mfg. Co.

Alloys and Bearing Metals. (See Bearings and Bearing Metals.)

Alloys, Steel and Iron.
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Ohio Brass Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Automobiles and Buses.
Brill Co., The J. G.

Axles.
National Tube Co.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The
Western Electric Co.

Bankers and Brokers.
National City Co.

Batteries, Dry.
Johns-Manville Co., H. W.
Western Electric Co.

Batteries, Storage.
Electric Storage Battery Co.
Western Electric Co.

Bearings and Bearing Metals.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
More-Jones Brass & M. Co.
St. Louis Car Co.
Westinghouse Elec. & M. Co.

Bearings, Center.
Baldwin Locomotive Works.
Holden & White, Inc.

Bearings, Roller and Ball.
Gurney Ball-Bearing Co.
Hess-Bright Mfg. Co.
Railway Roller Bearing Co.

Bearings, Roller Side.
Holden & White, Inc.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.
Western Electric Co.

Benders, Rail.
Niles-Bement-Pond Co.
Western Electric Co.
Zelnicker Sup. Co., W. A.

Blow Torches for Soldering and Brazing. (See Cutting Apparatus, Oxy-Acetylene.)

Blowers.
General Electric Co.
Westinghouse Elec. & M. Co.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Dearborn Chemical Co.
Johns-Manville Co., H. W.

Boiler Coverings.
Johns-Manville Co., H. W.

Boiler Tubes.
National Tube Co.

Bond Clips.
Electric Railway Improvement Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improvement Co.
Ohio Brass Co.

Bonding Tools.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Electric Railway.
Railway Bonding Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Bonds, Welded.
Lincoln Bonding Co.

Book Publishers.
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Etc.)
American Bridge Co.
Bates Expanded Steel Truss Co.
Electric Service Supplies Co.
Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.
Western Electric Co.

Brake Adjusters.
Holden & White, Inc.
Smith-Ward Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdy. Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Long Co., E. G.
St. Louis Car Co.

Brakes, Brake Systems and Brake Parts.
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Westinghouse Trac. B. Co.

Bridges and Buildings.
American Bridge Co.

Brooms, Track, Steel or Rattan.
Paxson Co., J. W.
Western Electric Co.
Zelnicker Supply Co., W. A.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.

Brushes, Carbon.
American Carbon & Battery Co.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
Dixon Crucible Co., Jos.

Bumpers, Car Seat.
Electric Service Supplies Co.

Bunkers, Coal.
American Bridge Co.

Bushings, Case Hardened and Manganese.
Bemis Car Truck Co.

Bushings, Fibre.
Diamond State Fibre Co.

Buttons. (See Badges and Buttons.)

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Stops—Automatic.
Consolidated Car Heating Co.

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc. —See those headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Jewett Car Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Stephenson Co., John.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co.
Kerschner Co., Inc., W. R.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Castings, Brass.
Columbia M. W. & M. I. Co.
Eureka Co.
Frankel Connector Co.
More-Jones Brass & M. Co.

Castings, Composition or Copper.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.

Castings, Gray Iron and Steel.
Amer. Brake Shoe & Fdy. Co.
American Bridge Co.
American Steel Foundries.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
Amer. Brake Shoe & Fdy. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Eclipse Railway Supply Co.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
Ohio Brass Co.
Wood Co., Chas. N.

Ceiling, Car.—(See head lining.)

Charging Sets, Storage Battery.
General Electric Co.

Chemists.
Little, Inc., Arthur D.

Circuit Breakers.
Cutter Electrical & Mfg. Co.
General Electric Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
Frankel Connector Co.
General Electric Co.
Hubbard & Co.
Klein & Sons, Mathias.
Ohio Brass Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Cleaners and Scrapers, Track. —(See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.
Western Electric Co.

Cleats, Car Wiring.
General Electric Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling.—(See Conveying and Hoisting Machinery.)

Coasting Clocks.
Railway Improvement Co.

Coil Banding and Winding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Western Electric Co.

Coils, Armature & Field.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
International Register Co., The.

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices.
General Electric Co.

Standing the Overload

What's the usual result of an overload on your car motors or compressors?

A puff of smoke—followed by a trip to the repair shop. You can eliminate these trips by using

Salamander Fireproof Wire

motor field, armature and compressor coils. You can't burn out Salamander Wire Coils. We've had them red-hot on test without any breakdown.

Send for samples and catalogs.

Independent Lamp & Wire Co., Inc.
Offices: 1737 Broadway, New York
FACTORIES: York, Pa., and Weehawken, N. J.

The Margin of Certainty

Like a factor of safety is the liberal margin of quality that is built into all

Weston

Indicating Instruments

Each instrument, in its accuracy, its overload capacity, etc., is capable of service far in excess of any demands that can be foreseen in the field for which it is designed.

As a result, the unfailing reliability of Weston Instruments has earned the implicit confidence of their users.

Weston Electrical Instrument Co.
21 Weston Ave.
Newark, N. J.

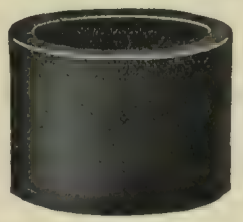
23 Branch Offices in the Larger Cities

Write for particulars regarding Weston Models designed for any field of Indicating Electrical Measurement that interests you.

Model 310
Single Phase and D.C. Wattmeter

LONGWEAR BUSHINGS
For Brake Gear

Hardened
Steel
Accurate
Uniform



also
LONGWEAR
BRAKE PINS
to
Specifications

E.G. Long Company
50 Church Street New York

HORNE RAILWAY DEVICES

Horne Double Acting Brakes
Giant Geared Brakes
Differential Staffless Brakes
Sterling Safety Brakes
Sterling Trolley Bases
Sterling Sand Boxes
Air Rectifiers, eliminating frozen air brake piping
Q-P Trolley Catchers
Lord Screenless Air Cleaners for Compressors
Hydrogrounds and Lightning Arresters
Fenders and Wheelguards
Controller Fingers
Friction and Rubber Tape
Packing and Gaskets
Air Hose and Rubber Specialties

HORNE MANUFACTURING CO., 50 Court St., Brooklyn, N. Y.

Samson Bell and Register Cord

Solid braided cotton, extra quality. All sizes and colors. More durable, more economical and better looking than leather or rawhide. Send for samples and full information.

SAMSON CORDAGE WORKS BOSTON, MASS. 2

National Railway Appliance Company

50 East 42d St., NEW YORK CITY
Chicago Washington, D. C.

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SELLING AGENTS FOR

Tool Steel Gears and Pinions
Johnson Fare Box
Perry Side Bearings
Hartman Centering Center Plates
Wasson Trolley Bases
Garland Ventilator
Electric Arc Welders
High Class Railway Varnishes and Enamels
Elastic Car Waste

Special Agents for
Tool Steel Gear & Pinion Co.
Johnson Fare Box Co.
C. & C. Electric & Mfg. Co.
Holden & White

General Agents for Anglo-American Varnish Co.
Eastern Agents for Union Fibre Co.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

Commutators or Parts.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Long Co., E. G.
Western Electric Co.
Westinghouse Elec. & M. Co.

Compressors, Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Trac. B. Co.

Condensers.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Connectors, Solderless.
Frankel Connector Co.
Horne Mfg. Co.

Conduits.
Western Electric Co.

Conduits, Underground.
Johns-Manville Co., H. W.

Controller Fingers.
Horne Mfg. Co.

Controller Regulators.
Electric Service Supplies Co.

Controllers or Parts.
Allis-Chalmers Mfg. Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Kerschner Co., Inc., W. R.
Westinghouse Elec. & M. Co.

Controlling Systems.
General Electric Co.
Westinghouse Elec. & M. Co.

Converters, Rotary.
Allis-Chalmers Mfg. Co.
General Electric Co.
Western Electric Co.
Westinghouse Elec. & M. Co.

Conveying and Hoisting Machinery.
American Bridge Co.
Columbia M. W. & M. I. Co.
Green Engrg. Co.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The.
Long Co., E. G.
Roebling's Sons Co., John A.
Samson Cordage Works.

Cord Connectors and Couplers.
Electric Service Supplies Co.
Samson Cordage Works.
Wood Co., Chas. N.

Couplers, Car.
Brill Co., The J. G.
Long Co., E. G.
Ohio Brass Co.
Van Dorn Coupler Co.
Westinghouse Trac. B. Co.

Couplings, Conduit.
Horne Mfg. Co.

Cranes. (See also Hoists.)
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.

Creosoting. (See Wood Preservatives.)

Cross Arms. (See Brackets.)

Crossing Foundations.
International Steel Tie Co.

Crossing Signals. (See Signals, Crossing.)

Crossings, Track. (See Track, Special Work.)

Culverts.
American Rolling Mill Co.
Bark River B. & Culvert Co.
California Cor. Culvert Co.
Canada Ingot & Iron Co., Ltd.
Coast Culvert & Flume Co.
Corrugated Culvert Co.
Delaware Metal Culvert Co.
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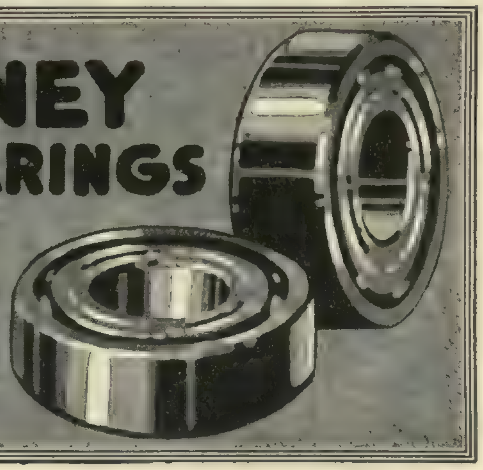

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These investigations have established the following facts:

Conservation of the nation's timber supply requires that all poles should be given preservative treatment.

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Johns-Manville Co., H. W.
Klein & Sons, Mathias.
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American Bridge Co.
Archbold-Brady Co.
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Tower Wagons and Automobiles.
McCardell & Co., J. R.

Track, Special Work.
Cleveland Frog & Cross. Co.
Columbia M. W. & M. I. Co.
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Transfers. (See Tickets.)

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Allis-Chalmers Mfg. Co.
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General Electric Co.
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More-Jones Brass & M. Co.
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Trolleys & Trolley Systems.
Ford Chain Block & Mfg. Co.

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Holden & White, Inc.

Trolley Wheels. (See Wheels, Trolley.)

Trucks, Car.
American Steel Foundries.
Baldwin Locomotive Works.
Bemis Car Truck Co.
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Allis-Chalmers Mfg. Co.
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Vacuum Drying & Impregnating Apparatus.
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Valves.
National Tube Co.
Ohio Brass Co.

Varnishes. (See Paints, etc.)

Ventilators, Car.
Brill Co., The J. G.
Globe Ventilator Co.
Holden & White, Inc.
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Vestibules, Portable.
Brill Co., The J. G.

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Diamond State Fibre Co.

Water Softening & Purifying Systems.
Scaife & Sons Co., Wm. B.

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Electric Railway Improvement Co.
General Electric Co.
National Ry. Appliance Co.
Lincoln Bonding Co.
Westinghouse Elec. & M. Co.

Wheel Guards. (See Fenders & Wheel Guards.)

Wheel Presses. (See Machine Tools.)

Wheels, Car, Cast Iron.
Bemis Car Truck Co.
Griffin Wheel Co.
Long Co., E. G.

Wheels, Car, Steel and Steel Tired.
American Steel Foundries.
Bemis Car Truck Co.
Carnegie Steel Co.
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Wheels, Trolley.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Eureka Co.
General Electric Co.
Hensley Trolley & Mfg. Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Long Co., E. G.
More-Jones Brass & M. Co.
Nuttall Co., R. D.
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Whistles, Air.
General Electric Co.
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Winding Machines. (See Coil Banding and Winding Machines.)

Wire Rope.
American Steel & Wire Co.
Roebling's Sons Co., John A.

Wires and Cables.
Aluminum Co. of America.
American Steel & Wire Co.
Bridgeport Brass Co.
D & W Fuse Co.
General Electric Co.
Packard Electric Co.
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Roebling's Sons Co., John A.
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But if you are maltreating your commutators with cheap carbon brushes—your tip from Karma is either to change *now* or get your ad in the "Positions Wanted" columns of this paper—before the machines get *you*.

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ALPHABETICAL INDEX TO ADVERTISEMENTS

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Printing begins on Tuesday of each week.
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New Advertisements (not changes of copy) received up to Wednesday noon can appear in the issue of that week, but no proofs can be shown.
If proofs before printing are required, change of copy and copy for new advertisements must be in our hands 10 days in advance of the date of publication.

A

Page

Alcott, Edward.........Front Cover
Allis-Chalmers Mfg. Co......... 35
Aluminum Co. of America...... 39
Amer. Brake Shoe & Fdry. Co.. 38
American Bridge Co........... 29
American Car Co.............. 59
American Carbon & Battery Co.. 45
American Mason S. T. Co...... 44
American Rolling Mill Co...... 13
American Steel Foundries....... 23
American Steel & Wire Co...... 41
Anderson Mfg. Co., A. & J. M.. 39
Archbold-Brady Co. 40
Archer & Baldwin, Inc.......... 46
Arnold Co., The............... 28
Arthur Power-Saving Recorder Co., The 19

B

Babcock & Wilcox Co........... 42
Baker, Wm. M.................. 13
Baldwin Locomotive Works, The 45
Bark River Bridge & Cul. Co.... 13
Barrett Co., The............... 53
Bates Expanded Steel Truss Co. 39
Beeler, John A................. 28
Bemis Car Truck Co............ 51
Bonham Recorder Co........... 18
Bonney-Vehslage Tool Co....... 45
Bridgeport Brass Co............ 6
Brill Co., The J. G............ 59
Buckeye Jack Mfg. Co.......... 42
Burch, Edw. P................. 29
Byllesby & Co., H. M.......... 28

C

California Cor. Culvert Co...... 13
Canada Ingot Iron Co., Ltd..... 13
Canton Culvert & Silo Co....... 41
Carnegie Steel Co.............. 36
Carney & Co., B. J............. 40
Cincinnati Car Co.............. 46
Cleveland Armature Works..... 47
Cleveland Frog & Crossing Co... 41
Coast Culvert & Flume Co...... 13
Collier, Inc., Barron G......... 32
Columbia M. W. & M. I. Co.... 20
Consolidated Car Fender Co..... 22
Consolidated Car-Heating Co.... 44
Cooper Heater Co., The........ 44
Corrugated Culvert Co.......... 13
Cutter Co., The................ 42

D

D & W Fuse Co................ 29
Daum, A. F................... 29
Dearborn Chemical Co.......... 42
Delaware Metal Culvert Co...... 13
Delta Star Electric Co.......... 39
Diamond State Fibre Co........ 40
Dixie Culvert & Flume Co...... 13
Dixon Crucible Co., Joseph..... 43
Duff Manufacturing Co., The.... 43

E

Eclipse Ry. Supply Co.......... 44
Electric Equipment Co.......... 46
Electric Railway Improve. Co... 8

Page

Electric Service Supplies Co.... 11
Electric Storage Battery Co..... 44
Elec'l Testing Laboratories...... 28
Ellcon Co., The................ 37
Eureka Co. 43

F

Federal Sign Co............... 40
Ford, Bacon & Davis........... 28
Ford Chain Block & Mfg. Co.... 43
"For Sale" Ads.............46, 47
Frankel Connector Co.......... 39

G

General Electric Co..26, Back Cover
General Devices & Fittings Co... 21
Globe Ventilator Co............ 45
Gold Car Heating & Lighting Co. 43
Green Eng'g Co................ 41
Griffin Wheel Co............... 36
Gurney Ball Bearing Co........ 51

H

Hale & Kilburn Co............. 16
Hardesty Mfg. Co., R........... 13
Hartshorn Co., Stewart......... 44
"Help Wanted" Ads.........46, 47
Hensley Trolley & Mfg. Co..... 44
Hess-Bright Mfg. Co........... 31
Holden & White, Inc........... 43
Horne Mfg. Co................ 49
Hubbard & Co................. 40
Hunt & Co., Robert W.......... 28

I

Illinois Cor. Metal Co.......... 13
Independence Culvert Co....... 13
Indianapolis Switch & Frog Co.. 12
Independent Lamp & Wire Co.. 49
Ingersoll-Rand Co. 51
International Register Co., The.. 44
International Steel Tie Co., The. 9
Iowa Pure Iron Culvert Co...... 13

J

Jackson, D. C. & Wm. B........ 28
Jeandron, W. J................ 51
Jewett Car Co................. 38
Johns-Manville Co., H. W....... 34

K

Kentucky Culvert Co........... 13
Kilby Frog & Switch Co........ 41
Kinnear Mfg. Co.............. 43
Klein & Sons, Mathias.......... 39
Kuhlman Car Co., G. C......... 59

L

Page

Lee-Arnett Co. 13
Lincoln Bonding Co........... 34
Lindsley Bros. Co............. 40
Little, Inc., Arthur D.......... 28
Long Co., E. G................ 49
Lone Star Culvert Co.......... 13
Lyle Cor. Culvert Co........... 13

M

McCardell & Co., J. R.......... 40
McGraw-Hill Book Co., Inc..... 33
MacGovern & Co., Inc.......... 46
Marsh & McLennan............ 40
Michigan Bridge & Pipe Co..... 13
Montana Cul. & Flume Co...... 13
More-Jones Brass & Metal Co.. 24
Morgan Crucible Co........... 55
Murphy Iron Works............ 41

N

National Brake Co............ 27
National City Co.............. 28
National Pneumatic Co......... 15
National Railway Appliance Co.. 49
National Tube Co............. 40
Nebraska Culvert & Mfg. Co.... 13
Nelsonville Brick Co........... 14
Nevada Metal Mfg. Co......... 13
New England Metal Cul. Co.... 13
New York Switch & Cross. Co.. 41
Niles-Bement-Pond Co......... 42
North-East Metal Cul. Co...... 13
Northwestern Sheet & Iron Wks. 13
Nuttall Co., R. D.............. 45

O

Ohio Brass Co................ 7
Ohio Cor. Culvert............. 13
O'Neall Co., W. Q............ 13

P

Packard Electric Co........... 43
Page & Hill Co................ 40
Page Woven Wire Fence Co.... 40
Pantasote Co., The............ 30
Paxson Co., J. W............. 39
Pennsylvania Metal Cul. Co..... 13
Perey Mfg. Co., Inc........... 45
"Positions Wanted" Ads........ 47
Power Specialty Co............ 42

R

Rail Joint Co.................. 41
Railway Bonding Co........... 29
Railway Improvement Co....... 25
Railway Roller Bearing Co...... 58
Railway Track-work Co......... 10
Railway Utility Co............. 45
Ramapo Iron Works........... 41
Richey, Albert S............... 28

Page

Road Supply & Metal Co....... 13
Roebling's Sons Co., John A.... 39
Rooke Automatic Register Co... 44

S

St. Louis Car Company, The.... 38
Samson Cordage Works......... 49
Sanderson & Porter............ 28
Sangamo Electric Co........... 17
Scaife & Sons Co., Wm. B...... 42
Scofield Engineering Co......... 28
Searchlight Section 46, 47
Second Hand Equip..........46, 47
Simmen Automatic Railway Signal Co. 40
Sioux Falls Metal Cul. Co...... 13
Smith Heater Co., Peter........ 44
Smith-Ward Brake Co.......... 51
Spokane Cor. Cul. & Tank Co... 13
Standard Steel Works Co....... 37
Standard Varnish Works....... 35
Standard Woven Fabric Co..... 43
Star Brass Works.............. 45
Stephenson Co., John.......... 59
Stephenson Sons & Co., S...... 28
Stone & Webster Eng'g Corp.... 28

T

Tennessee Metal Cul. Co........ 13
Titanium Alloy Mfg. Co........ 57

U

Union Spring & Mfg. Co........ 51
Universal Safety Tread Co...... 44
Utah Cor. Cul. & Flume Co..... 13

V

Valentine-Clark Co. 40
Van Dorn Coupler Co.......... 51
Virginia Metal Cul. Co......... 13

W

"Want" Ads 47
Wason Mfg. Co................ 59
Western Electric Co............ 55
Western Metal Mfg. Co........ 13
Westinghouse Elec. & Mfg. Co..2, 5
Westinghouse Traction Brake Co. 4
Weston Elec'l Instrument Co.... 49
White Companies, The J. G..... 28
Wisch Service, The P. Edw..... 29
Wood Co., Chas. N............. 40
Woodmansee & Davidson, Inc... 28
Wyatt Metal Works............ 13

Z

Zelnicker Supply Co., Walter A. 47

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Titanium-Treated Rail Only

The Los Angeles Railway began to install Titanium-treated rail in 1911.

Since then it has ordered Titanium-treated rail exclusively for all renewal and construction work.

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Using

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The Railway Roller Bearing Co.

Syracuse, New York

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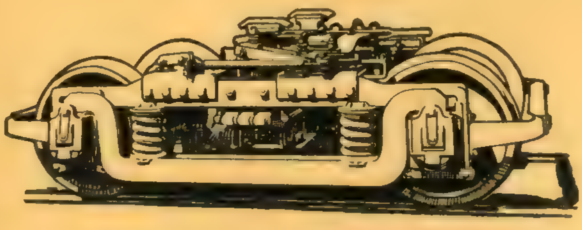

Moving Mountains

"Electrification has been such a tremendous success on the Milwaukee road that it is difficult to state the results without seeming exaggeration, but I think it quite within the fact to say that the Milwaukee road has forgotten that the Continental Divide exists."

C. A. GOODNOW
Assistant to the President,
C. M. & St. P. Ry.

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Ivy L. Lee on Increasing Costs of Operation

ELECTRIC RAILWAY JOURNAL

New York, June 30, 1917 McGraw-Hill Publishing Co., Inc. Vol. 49, No. 26 10c a copy

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This power plant of the Public Service Corporation of N.J. represents an investment of hundreds of thousands of dollars in valuable machinery alone. Waugh Construction was selected for the skylights over this machinery as well as for other "Public Service" plants because it provides perfect, permanent service. Bulletin 56 G describes and illustrates other important structures upon which Waugh Construction is used.

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The Thought of the Hour

"EVERYBODY seems to be doing his bit," exclaimed the General Manager, as he laid the morning paper on his desk, "and we must do ours, too, Joe!"

"Well, boss," replied Joe, "what do you suggest? I'm ready and willing to exert every effort."

"Joe," continued the General Manager, "our latest equipment of Westinghouse No. 506 motors and HLD Control have shown an economy of 15 to 20 per cent compared with our older cars. These new cars make fast schedules—the safety devices have eliminated nearly all the expensive damage claims, and the public is satisfied with the service. The increased receipts on this line prove this.

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"All right, boss," answered Joe, "I will have the dope in about two days. You know the New York State Railways have just ordered 25 new cars with No. 506 motors and HLD Control."

Westinghouse Electric & Manufacturing Company

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Large American Cities

East Pittsburgh
Pennsylvania

INDEX FOR VOL. XLIX APPEARS IN THIS ISSUE

ELECTRIC RAILWAY JOURNAL

H. W. Blake, Editor

Volume XLIX, No. 25 — NEW YORK, JUNE 30, 1917 — Pages 1173 to 1214

CONTENTS

Power Tools on Track Work Save Time and Money

Frederic H. Hill tells how pneumatic asphalt cutting tools and tie tampers, steam shovel and self-propelled concrete mixer were called out to help solve the labor problem..............................Page 1176

How the Costs of Operation Are Steadily Mounting

Ivy L. Lee gives significant data from various parts of the country which show the need of financial relief for electric railways. Business suffering from an economic disaster..............................Page 1180

Features of a Non-Telescoping Car for the Erie

Provision against disastrous effects of collisions has been made by tying the sides together at floor and roof with heavy plates connected by vertical beams, making a complete box frame for either end of the car ....Page 1185

Equipment and Its Maintenance.....1191

One-Man Safety Car Made from Old Box Car for $700 —*By H. E. Weyman.*
Two-Car Train Unit Being Tried Out in New York City.
When Does It Pay to Splice Up Scrap Feed Wire?—*By S. L. Foster.*
Oak Shims Used in Track Rehabilitation.
Home-Made Equipment for Circuit-Breaker Testing—*By W. P. Lish.*
Armature Shafts Repaired by Welding on Steel Tubing.
Cost of Erecting Overhead Work—XI.
Waterproofing Rail Joints with Asphaltum—*By A. L. Kalloch.*
Recording-Demand Watt-Hour Meter.
Maintenance of Rattan Seating.

Editorials 1173

Be Ready for Cantonments.
Power Tools to Offset Labor Shortage.
The Sacrifice of Habit.
When the Public Understands.
How Best Can a Boy Learn a Trade?
Help Us to Tell the Truth.
Where Local Associations Are a Good Thing.
Loss of Home Rule Does Not Affect Present Chicago Arrangement.

Making the Change to Near-Side Stop Easy for Railway Patrons........1179

New York Annual Meeting..........1183

How the War Will Affect Utilities..1184

Six-Cent Fare Asked in New York State 1187

Cities Favor Six-Cent Fare in Bay State 1188

Schedule Boards for Patrons........1189

Employees' Club in Portland, Ore...1189

Communication 1190

American Association News.........1190

Interesting Westchester Men in Safety 1190

Forestation Venture by Illinois Traction System 1190

News of Electric Railways...... ...1197

Plans for Rhode Island Investigation.
Strike in Steubenville.
Southern Pacific Fuel Problems.
Toledo Mayor Seeks Valuation.
New Wage Scales in Chicago.
Active Work on St. Louis Compromise.
British Columbia Strike Settled.
Meaning of Loss of Chicago Bills.
Bonus Payment at Athens.
Violence in Dayton Strike.
Cleveland Subway Discussed.

Financial and Corporate............1202

Traffic and Transportation..........1205

Seattle Service Decision.
M. V. T. Has Employees' Bulletin.
Texas Has New Traffic Law.

Legal Notes 1207

Personal Mention 1208

Construction News 1209

Manufactures and Markets..........1211

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Advertising Indexes—Alphabetical, 48; Classified, 40, 42, 44, 46; Searchlight Section, 38, 39.

The

Westinghouse "Bungalow"

compressor is an Air Brake Specialist's product and is adopted as standard on many electric railways, because:

First; best possible design to perform the work reliably and efficiently.

Second; best materials, careful workmanship, rigid inspection and test.

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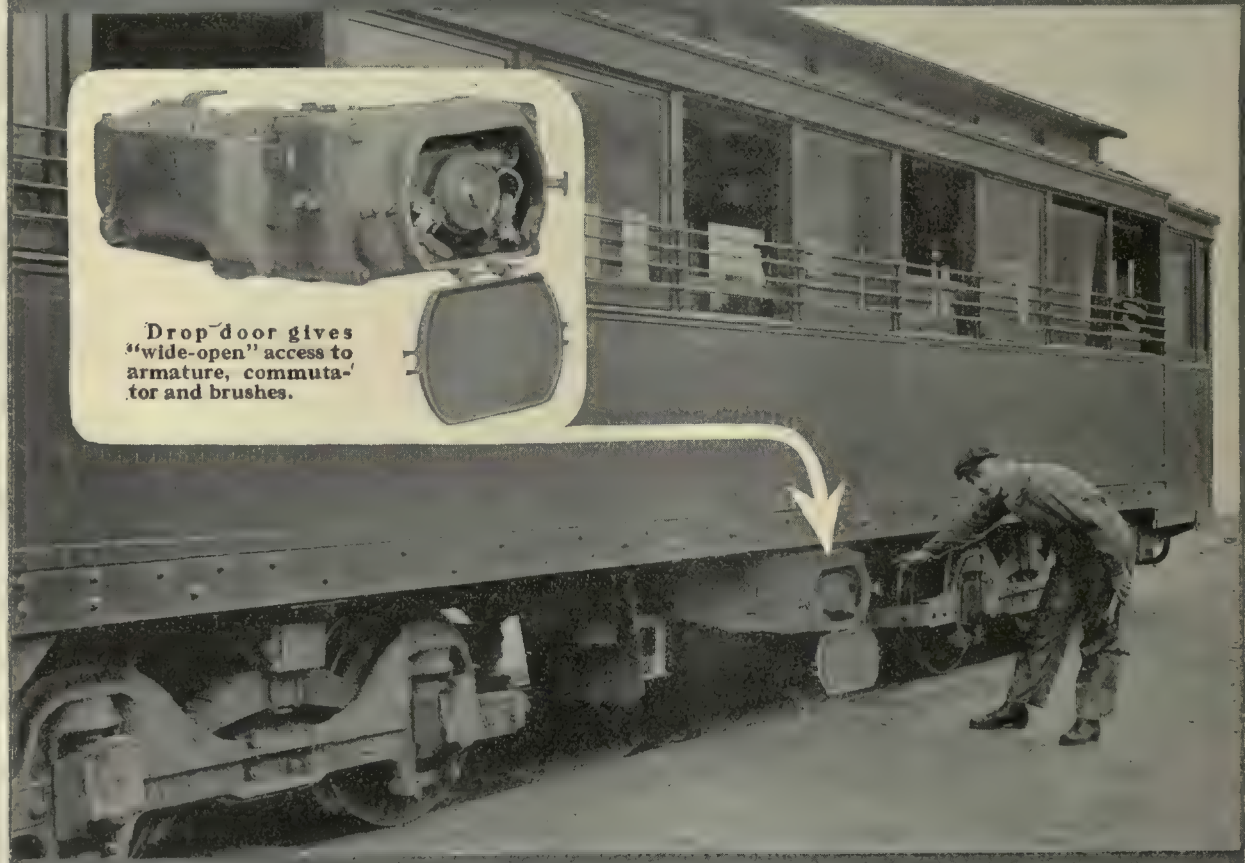

Drop door gives "wide-open" access to armature, commutator and brushes.

Westinghouse Traction Brake Company

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Westinghouse

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This list of Westinghouse Underfeed Stokers installed and on order was prepared to show their wide distribution throughout the United States:

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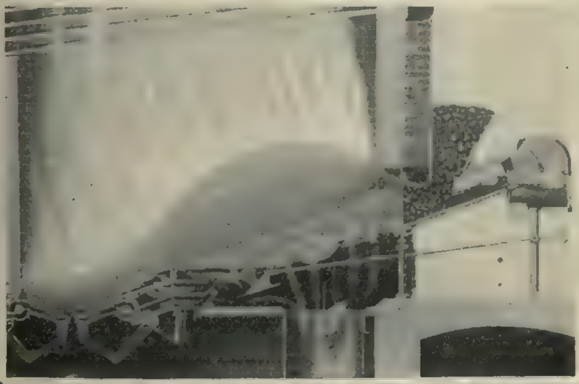
City of Detroit, Michigan	2	1370
Consumers Power Co., St. Paul, Minn	4	2000
Firestone Tire & Rubber Co., Akron, O	2	1750
“ “ (Repeat Order)	2	1750
Norfolk & Western R. R. Co., Bluestone, W. Va.	10	6670
“ “ (Repeat Order)	2	1334
Public Service Elec. Co., Jersey City, N. J	5	3000
“ “ (Repeat Order)	5	3250
Roanoke Railway & Electric Co., Roanoke, Va	4	2100
“ “ (Repeat Order)	2	1000
Spang-Chalfant Co., Pittsburgh, Pa	2	1000
“ “ (Repeat Order)	1	For Heating Furnace
“ “ (Repeat Order)	1	“ “ “
United Gas & Elec. Engr. Corp., New Orleans, La.	1	900
“ “ (Repeat Order)	2	1800
“ “ (Repeat Order)	5	4500
U. S. Navy Yards, Brooklyn, N. Y	12	5120
U. S. Proving Grounds, Indian Head, Md	8	3812
West Penn Traction Co., Connellsville, Pa	3	3900
Minneapolis General Elec. Co., (H. M. Byllesby & Co.), Minneapolis, Minn.	12	7200
“ “ (Repeat Order)	5	6310
Cluett-Peabody & Co., Troy, N. Y	2	1000
“ “ (Repeat Order)	2	1000
American Gas & Elec. Co., Windsor, W. Va	5	6310
“ “ (Repeat Order)	3	3786
“ “ (Repeat Order)	4	5048
“ “ (Repeat Order)	4	5048
Harrison Bros. & Co., Philadelphia, Pa	5	2500
Western Lt. & Power Co., Lafayette, Colo	1	411
“ “ (Repeat Order), Cheyenne, Wyo	2	911
“ “ (Repeat Order), Lafayette, Colo	4	1644
Transit Supply Co., Minneapolis, Minn	1	550
“ “ (Repeat Order)	11	6050
Interstate Lt. & Pwr. Co. (H. M. Byllesby & Co.), Galena, Ill	2	820
“ “ (Repeat Order)	4	1640
“ “ (Repeat Order)	2	820
Arkansas Valley Ry., Lt. & Pr. Co. (H. M. Byllesby & Co.), Canon City, Colo	3	1800
Union Elec. Lt. & Pr. Co., St. Louis, Mo	10	5580
“ “ (Repeat Order)	6	3348
Merchants Heat & Lt. Co., Indianapolis, Ind	8	4000
“ “ (Repeat Order)	2	2000
Alabama Power Co., Birmingham, Ala	5	6000
Edison Electric Illum. Co., Boston, Mass	8	4096
“ “ (Repeat Order)	6	3348
Union Gas & Elec. Co., Cincinnati, O	8	10096
Duluth & Iron Range R. R. Co., Two Harbors, Minn	4	1000
Little Rock Ry. & Elec. Co. (United Gas & Elec. Engr. Corp.), Little Rock, Ark	2	1200

Write for descriptive circular



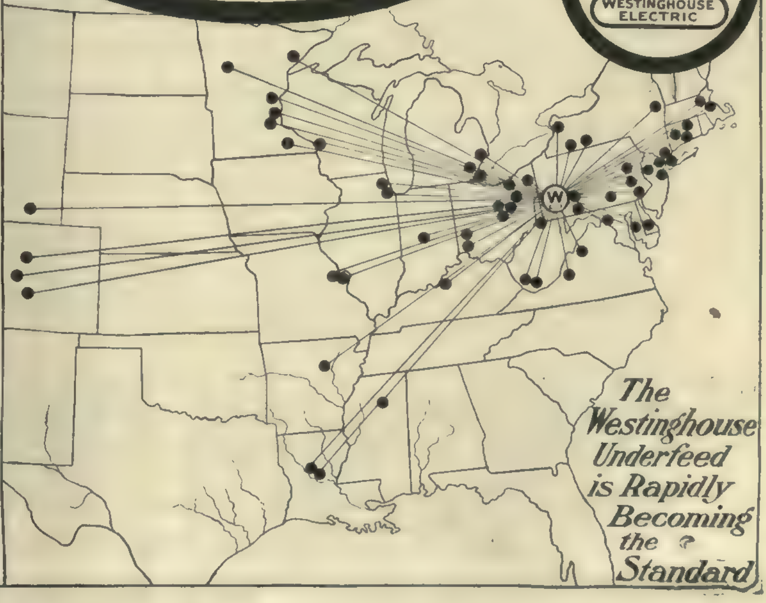
Wonderful Reserve Power

—NO waste—NO idle equipment —NO banked fires—NO spare boilers to be held in readiness for the daily peaks. For the Westinghouse Underfeed Stoker embodies IN ITS DESIGN a wonderful flexibility—a gigantic overload capacity.

Westinghouse Electric & Manufacturing Co.,
East Pittsburgh, Pa.

The Choice of a Stoker Always Narrows Down to a Study of Plant Requirements

W
WESTINGHOUSE ELECTRIC



Phono-Electric

—the trolley of long life

At Dead Man's Cut

Thus do the folk along the Norfolk & Western Railway call the cut illustrated because of the toll that it has taken in human lives.

Such an expression leads us to place emphasis on the **Safety** of Phono-Electric as a contact wire.

While the catenary construction of the Norfolk & Western would prevent a broken wire from touching the ground, it would not prevent contact with workers on the coal cars.

The use of Phono-Electric, however, is splendid safety insurance for this condition, because the toughness, homogeneity and non-crystallizing qualities of Phono-Electric assure a wire that will wear uniformly—a wire upon which actual measurements may be depended to indicate the danger point before breaking.

Bridgeport Brass Company
Bridgeport Connecticut

2040

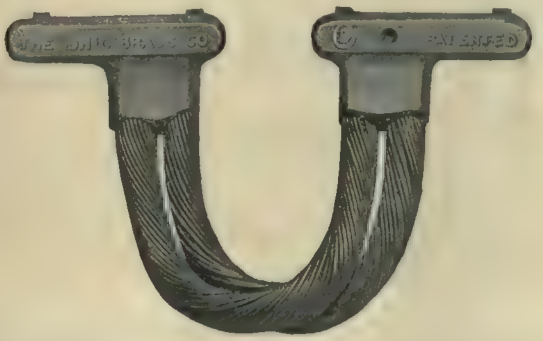
O-B Gas-Weld Rail Bonds

The Pioneer Gas-Weld Bonds with Exclusive Features

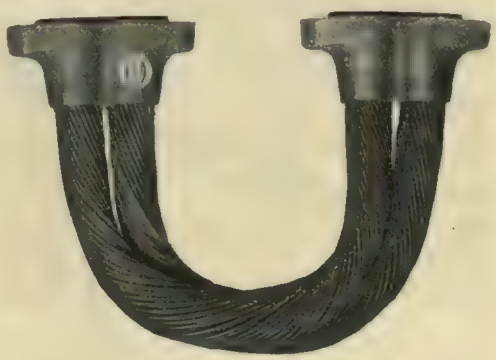
The third year since The O-B Company introduced Gas-Weld Bonding finds the O-B Bonds steadily gaining in popularity. Every buyer is a satisfied user. The frequent repeat orders are evidence of universal satisfaction.

The first purchaser installed over 10,000 bonds after he had investigated the thorough service trials made by the O-B Company. He has since made additional purchases of considerable quantity.

O-B Engineers follow and will continue to follow each installation. They will gladly demonstrate the process on your tracks.

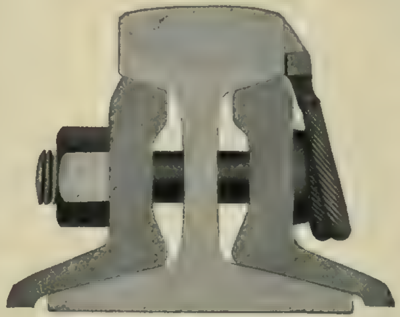


Type G-W Bond—Patented
All Copper



Type ST—Patented
Copper Strand—Steel-protected Terminal

Exclusive Patented Features of O-B Bonds



Section of O-B Bond on
Rail Showing Beveled Terminal

Before installation, the flat top of O-B Bonds forms a right angle with the face of the rail. In this angle the welder, with his work always in plain sight, builds up the beveled terminal which is almost immune to damage by downward blows from street traffic.

Small feet on the bond terminal hold it away from the rail, thus allowing room for the gases to escape and making possible a flawless weld at all points.

Numerous other patents

Our booklet, "Gas-Weld Bonding," tells all the details about this simple process. Write for a copy. The book or a demonstrator will be sent at your request.

The Ohio Brass Co., Mansfield, Ohio

New York Philadelphia Pittsburgh Chicago San Francisco Los Angeles

Western Red Cedar Poles

Used in this Great Electrification Project

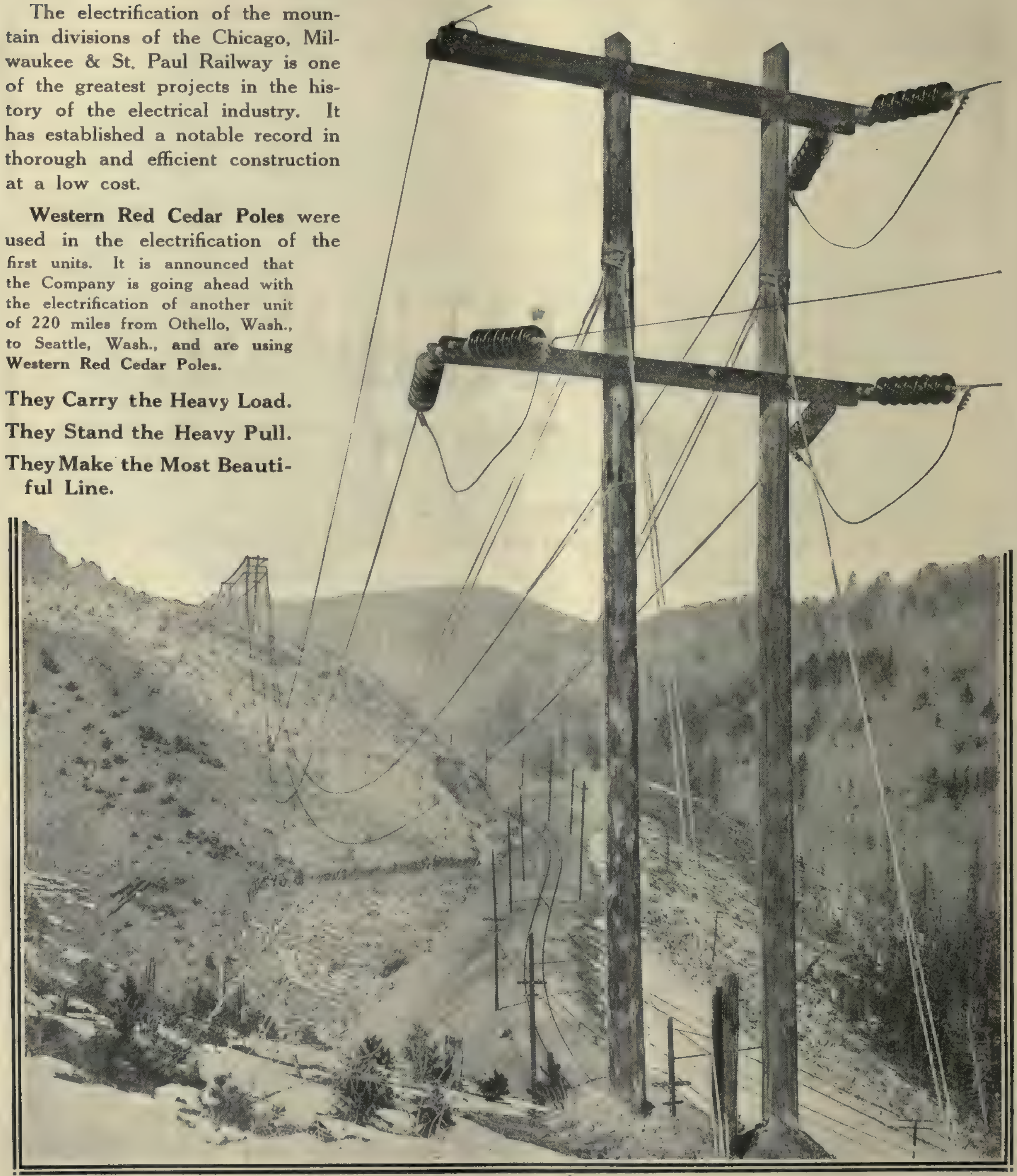
The electrification of the mountain divisions of the Chicago, Milwaukee & St. Paul Railway is one of the greatest projects in the history of the electrical industry. It has established a notable record in thorough and efficient construction at a low cost.

Western Red Cedar Poles were used in the electrification of the first units. It is announced that the Company is going ahead with the electrification of another unit of 220 miles from Othello, Wash., to Seattle, Wash., and are using Western Red Cedar Poles.

They Carry the Heavy Load.

They Stand the Heavy Pull.

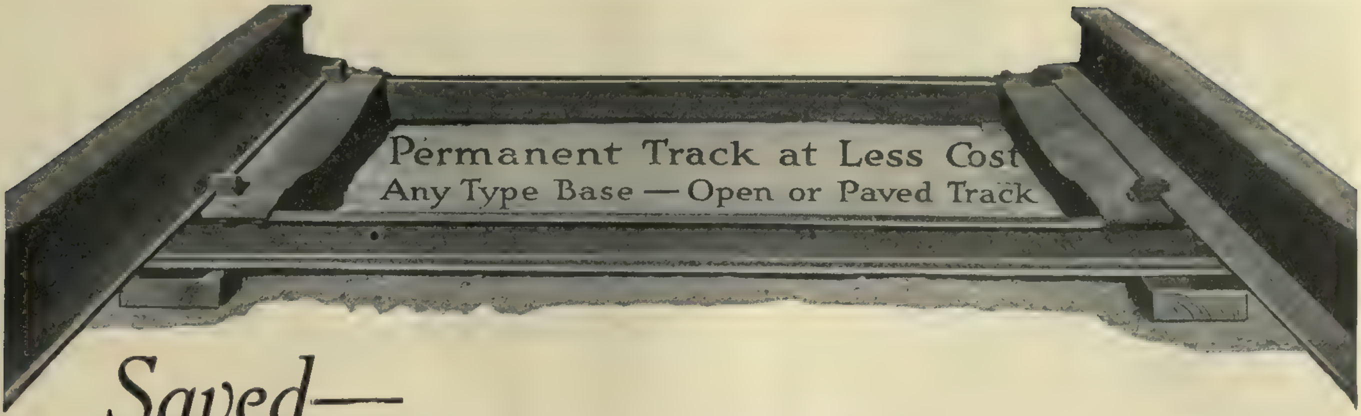
They Make the Most Beautiful Line.



On Chicago, Milwaukee & St. Paul Railway, 20 miles east of Butte, Montana. Weight supported by Pole Structure in foreground, 1335 pounds. Height of Pole above ground, 30 ft.; length of Span, 970 ft.

You are invited to write us for further information.

Western Red Cedar Association, Peyton Building, Spokane, Washington


Permanent Track at Less Cost
Any Type Base — Open or Paved Track

Saved—
\$1000 to \$6000 Per Mile of Track

by constructing with

INTERNATIONAL
STEEL TWIN TIES

Here Are the Figures: Comparison of Costs of Standard Wooden Tie and Steel Tie Track Construction from base of Rail to Subgrade.

Estimate Based on Type C. Track Shown
In A. E. R. E. A. Proceedings of 1914—Page 487

(6 in. x 8 in. x 8 ft. Ties in 9 ft. Trench)

5280 sq. yds. granite block paving at $2.25 per sq. yd	$11,880.00
880 tie rods 2 in. x 5/16 in. x 5 ft. at 50c	440.00
5280 tie plates at 30c	1,584.00
10,560 screw spikes and clips at 11c	1,161.60
Track labor (laying and surfacing)	2,640.00
2640 6 in. x 8 in. oak treated ties at $1.00	2,640.00
1494 cu. yds. of concrete at $5.00	7,470.00
1754 cu. yds. of excavation at $1.15	2,017.10
	$27,232.00*

*If tie plates; screw spikes and clips are omitted and cut spikes are used, deduct $2,601.00 from wooden tie construction estimate.

**In case tie rods are required, add $440.00 to steel tie construction estimate.

Estimate Based on Standard Steel Tie Construction

(International Steel Twin Ties in a 7 ft. Trench)

4110 sq. yds. Granite Block paving at $2.25 per yard	$9,274.50
880 Steel Twin Ties at $6.00 f.o.b. Cleveland	5,280.00
7040 clips and wedges at 7c	492.80
Track labor (laying and surfacing)	1,320.00
789 cu. yds. of concrete 1:3:6 at $5.00	3,945.00
801 cu. yds. of excavation at $1.15	921.15
	$21,216.45**
Total cost wooden ties	$27,232.00
Total cost steel ties	21,216.45
Total saving	$6,015.55

Labor saving shown in Steel Tie Estimate is made possible by the reduction of the number of ties, the simplicity of the fastening, the elimination of track gauging, the reduction in the number of blocks and wedges required to line and surface the track, and in the small quantities of excavation and concrete required.

Let us submit comparative estimates for your job

Prompt deliveries made from stock

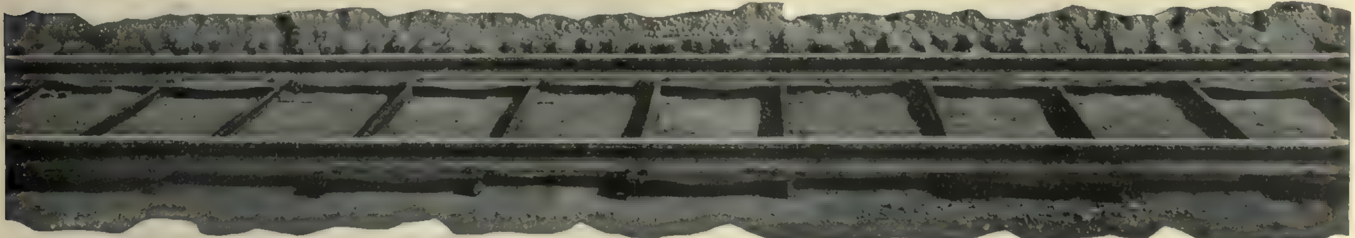
The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co., Los Angeles, Cal.
San Francisco, Cal. Seattle, Wash.
R. J. Cooper Co., Salt Lake City, Utah.
J. E. Lewis & Co., Dallas, Texas.
Maurice Joy, Philadelphia.
William H. Ziegler, Minneapolis, Minn.



Los Angeles

Thermit Insert Welds

continue to give an uninterrupted rail

In the March 16, 1916, issue of the Electric Railway Journal we quoted an official telegram, March 13, 1916, from the Los Angeles Railway that out of "300 Thermit Insert Welds made in 1913 on P S 116/292 rail; report of October, 1915, reads 'no breaks; no cupping; no pounding; perfect condition.' "

Thermit Insert Welds in course of installation on Main St., between Moneta Ave. and Slauson Ave., Los Angeles.

On April 25, 1917, personal inquiry made at Los Angeles disclosed the fact that

Thermit Insert Welds Have Shown No Breaks to Date

Records like this clearly prove that the Thermit Insert Weld is all that we assert. It is far more economical to pay a little more for first cost than to suffer the annoyance and expense of repairing breaks in service—

Especially as the repair of one bad break means the insertion of a new piece of rail and two joints for one.

Thermit Insert Welds Assure a Truly Continuous Rail

GOLDSCHMIDT THERMIT CO.

120 BROADWAY, N. Y.

329-333 Folsom St., San Francisco **103 Richmond St., W., Toronto, Ont.**
7300 So. Chicago Ave., Chicago

There's the way to bond for permanency

—using "Protected" Rail Bonds

The "Shot-Over" Sleeves protect the strands right at the point where they need protection against vibration—at the terminal.

The strands being of pure lake copper give further protection.

Permanency is further aided by the soft, pure, ductile copper lugs which compress perfectly.

There are "Protected" bonds for every class of service.

You ought to use them.

ELECTRIC SERVICE SUPPLIES CO.

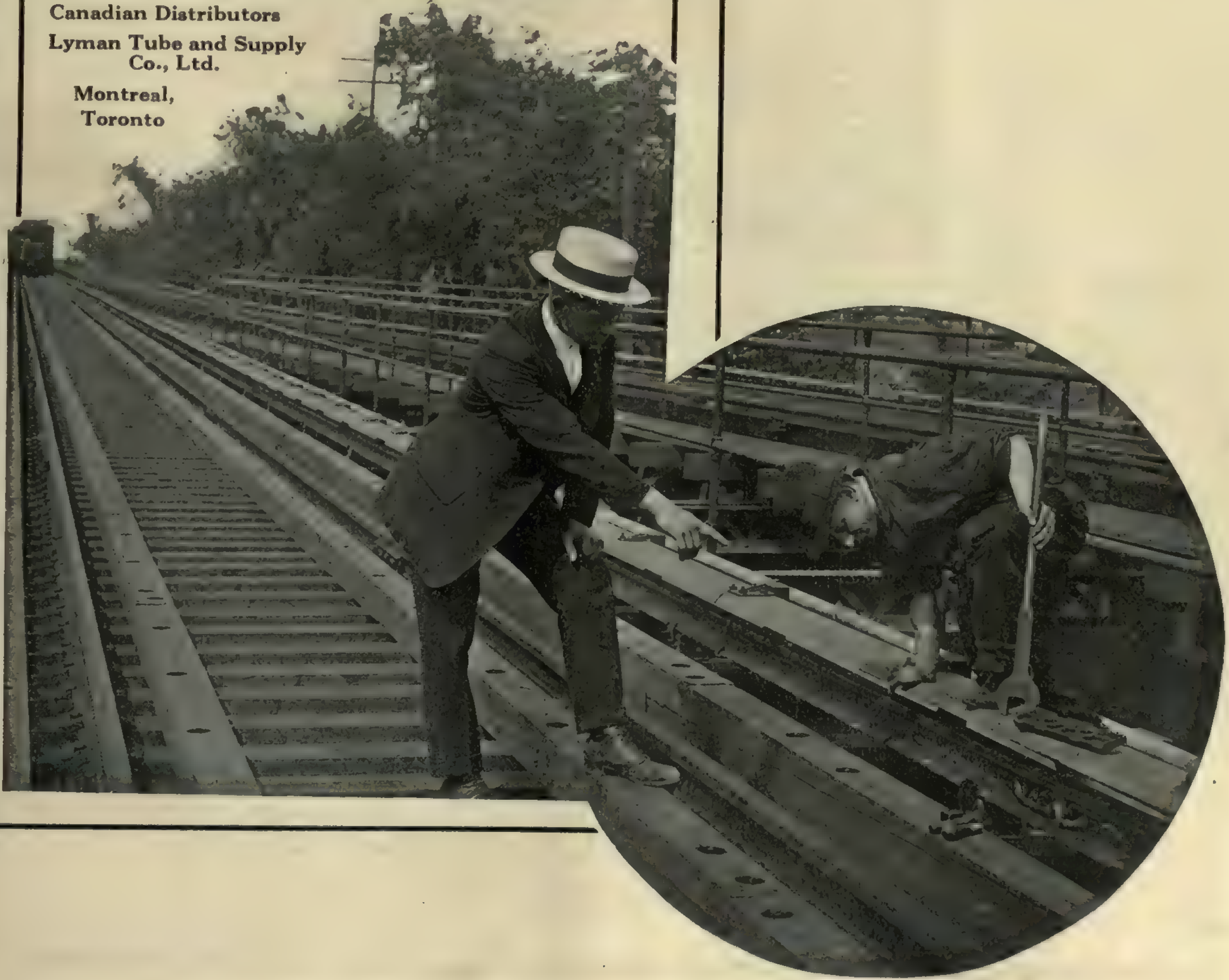
Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

Canadian Distributors
Lyman Tube and Supply Co., Ltd.
Montreal, Toronto

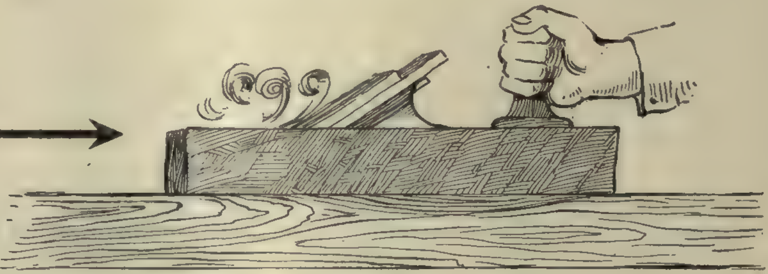


←To bring a rail in this condition

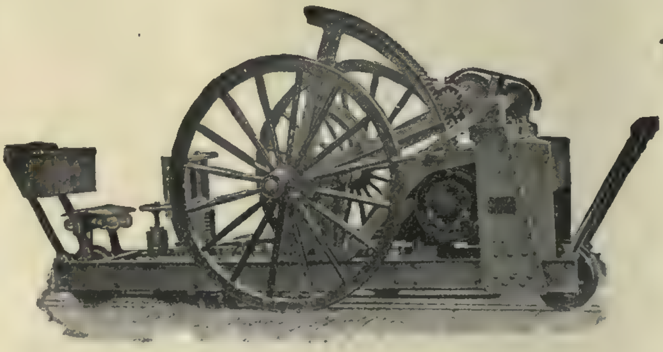
to a true, smooth surface

It doesn't require much imagination to see that the best possible process is a long, steady planing stroke that works

Like This ⟶



and Here is the Machine that gives that Stroke



The difference is that the plane stroke is effective in one direction only. The

Reciprocating Track Grinder

stroke is effective in both directions. It is working all the time.

It is the surest, most accurate, effective and least wasteful method of grinding out corrugations and cupped joints in rails.

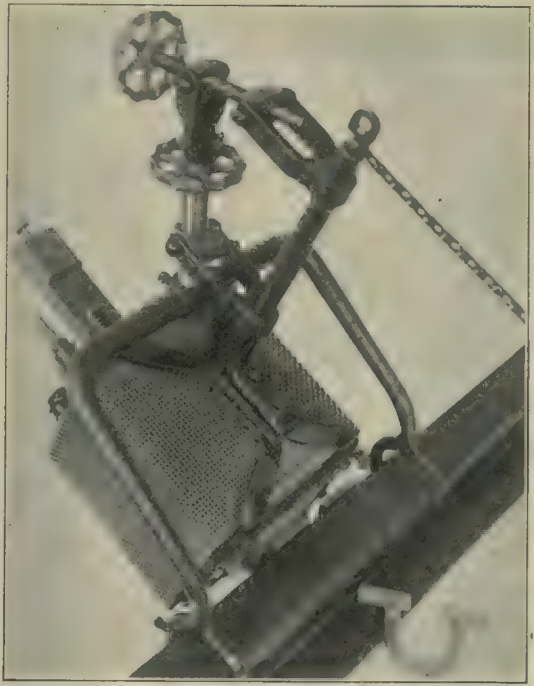
You can try it on your track at our expense.

It requires no skilled labor for operation.

Railway Track-work Co.

30th and Walnut Sts., Philadelphia

The Erico Portable Welder



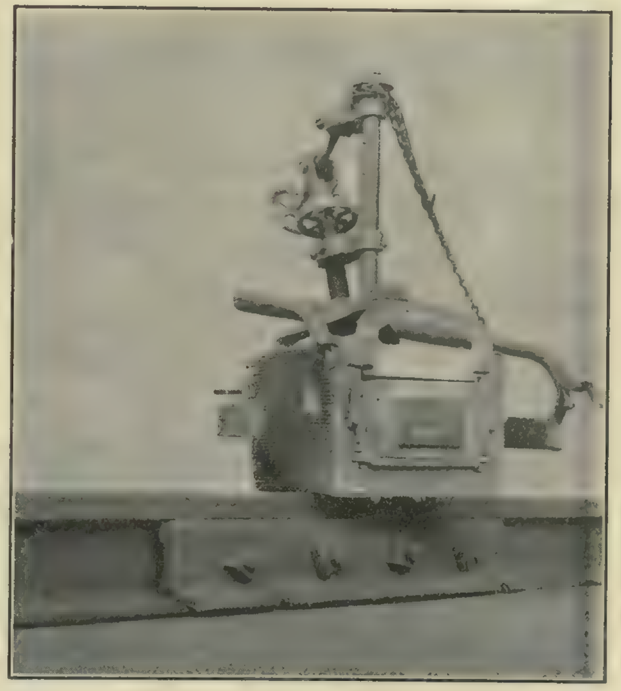
Top View

Has
No
Rotating
Parts

ERICO THE LINE OF LEAST RESISTANCE

We know of no better way of describing the simplicity of the Erico Portable Welder than to state that it contains no rotating parts. The rheostat is always in a tamper-proof, safety-first cage, while the furnace is made up of such elements as a metal chamber with a graphite lining, an electrode fitted with a handle, and an adjustable supporting frame.

In short, the Erico Portable Welder, while extremely light in weight, has no finely adjusted parts to get out of order.



Front View

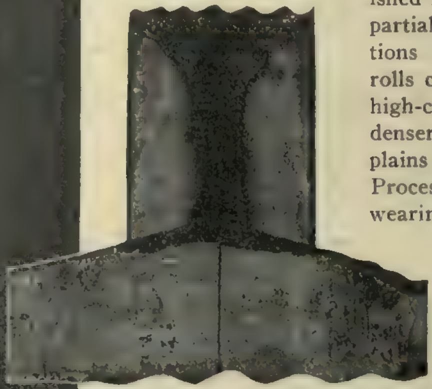
The Electric Railway Improvement Co.

Cleveland

How the Lackawanna Deseaming Process eliminates two very serious rail faults

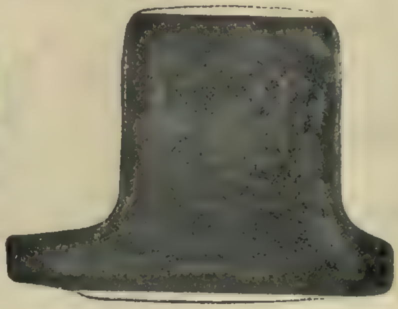
Greater Safety

through removal of all seamy metal from the vital part of the base



Typical base seam—the kind that tends to open up and cause fracture.

The weak, partially decarburized surface steel of the original ingot is ordinarily finished into the rail, but if hot-milled off the partially formed rail section, at the locations of rail head and base, the finishing rolls complete their work upon clean, solid high-carbon steel and produce a harder, denser and finer finish. This, in short, explains how the Lackawanna Deseaming Process eliminates seamy bases and soft wearing surface.



Better Service

through a harder top surface that is not so apt to wear down or slough off

Rail head sloughed off under the cold-rolling action of the wheels.

TREATMENT of the partially finished rail bar as described above is the only recent *real* improvement in rail manufacture—and is the most logical way of meeting present day increases in wheel load. This is proven by the marked resistance to wear and freedom from fracture, which Lackawanna Deseamed Rails have demonstrated in several years of service.

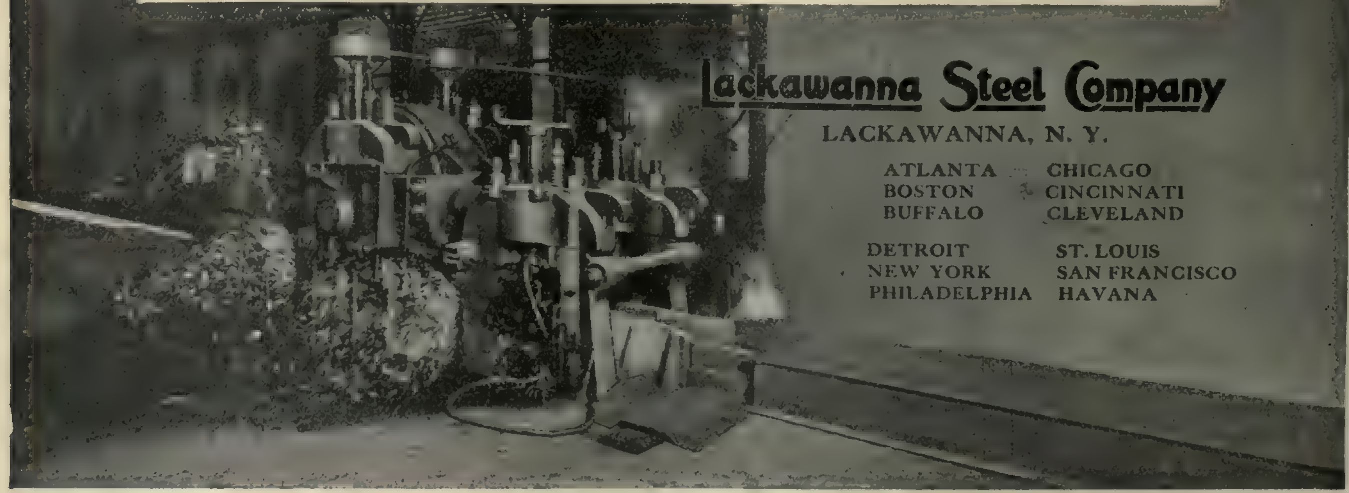
Etching away the head and base surfaces of rails made by this process shows an entire freedom from seamy, streaky metal at these locations, and hardness tests also prove that the metal here is slightly superior to that in the body of the rail.

This deseaming process, as originated and controlled exclusively by us, is now applied (see picture below) to all Lackawanna Sections of 50 pounds per yard and over.

Those seeking safer track, greater load capacity and reduced maintenance expense can profitably study our illustrated book on The Lackawanna Deseaming Process, which we will mail on request.

Ask for our booklet "Improved Track Appliances."

292



Lackawanna Steel Company

LACKAWANNA, N. Y.

ATLANTA
BOSTON
BUFFALO

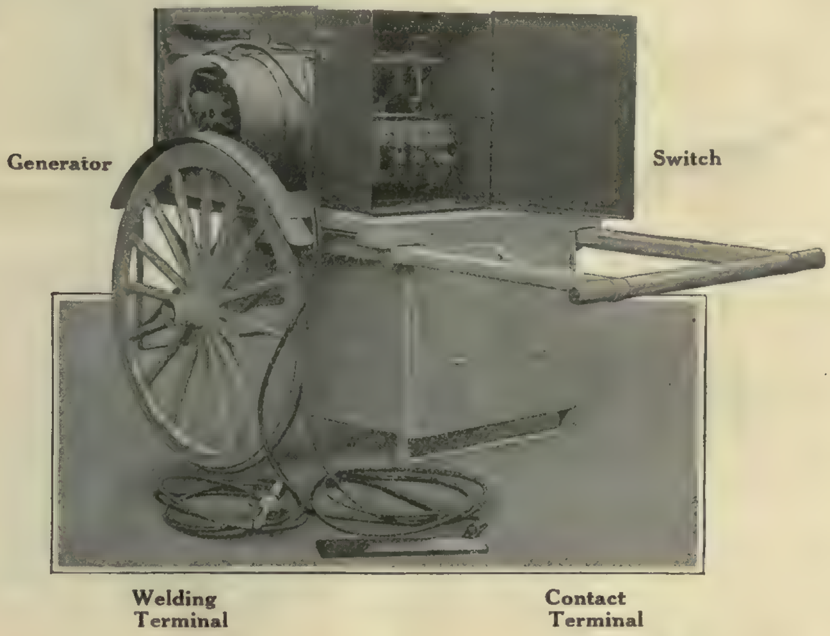
CHICAGO
CINCINNATI
CLEVELAND

DETROIT
NEW YORK
PHILADELPHIA

ST. LOUIS
SAN FRANCISCO
HAVANA

A Simple Welder

The Lincoln Arc Welder is simply a motor operated by power from the trolley line. This motor drives a generator, which delivers power at exactly the right voltage for the particular job at hand.



Lincoln Arc Welder

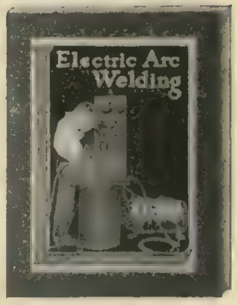
is free from all complicated devices or adjustments so that any workman can quickly learn to operate it. One terminal is laid on the rail, the operator picks up the other and welds.

No power is wasted in resistances, thus keeping current consumption low. There is no possibility of shock or injury to the operator.

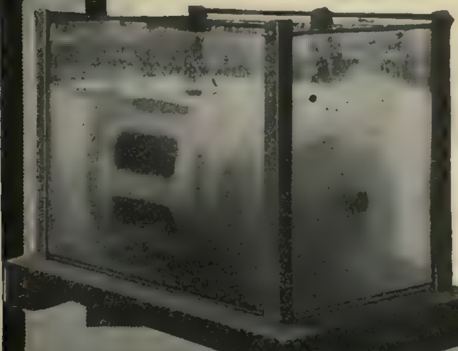
Ask for Welding Book 104-J

48 pages illustrated, containing a complete review of arc welding and examples of street railway work.

Write on your letterhead.



This standard Lincoln Motor has operated under water for over 3 years without damage to windings.

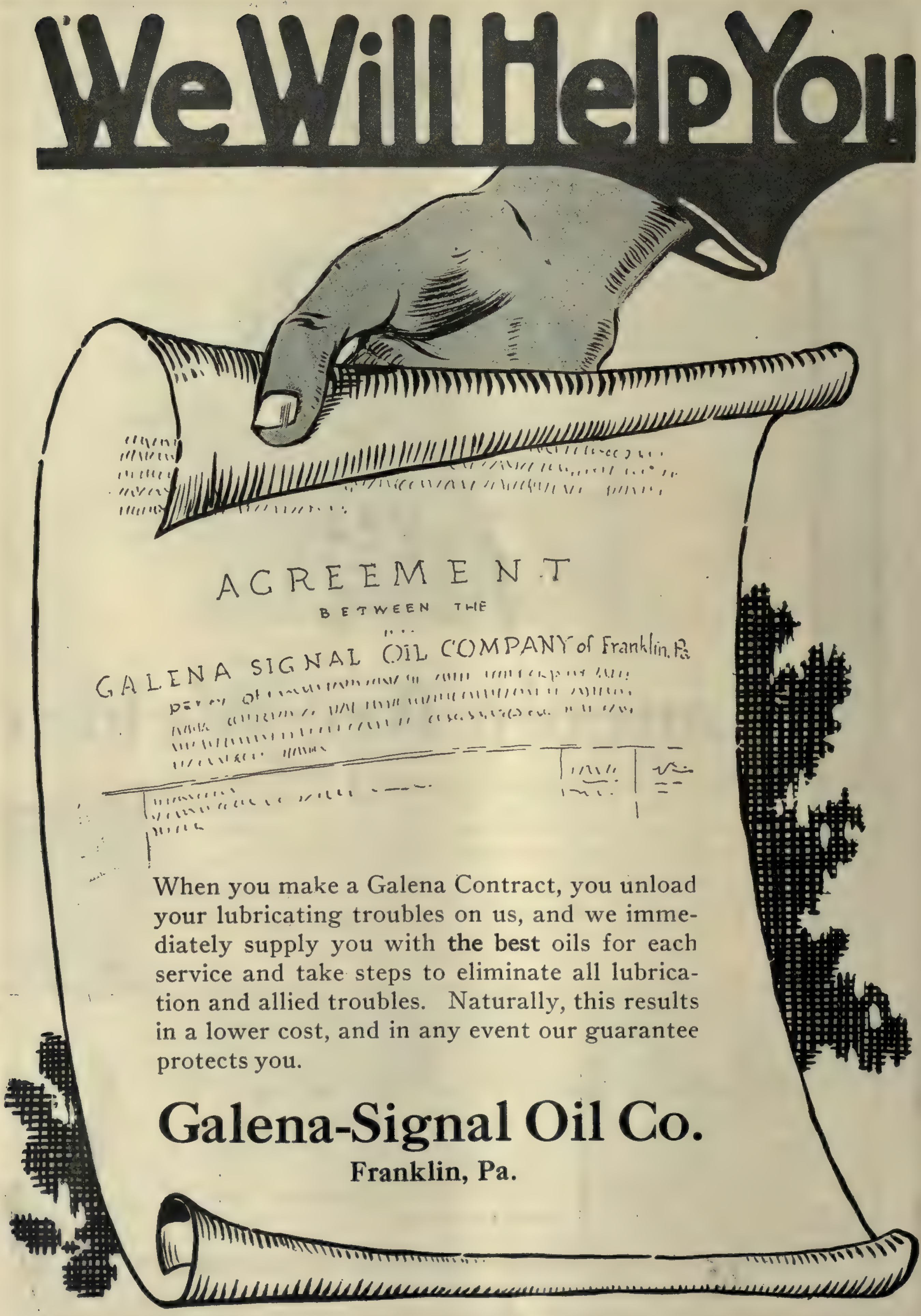


The Lincoln Electric Co.

Cleveland, Ohio

New York City (Singer Bldg.)
Buffalo
Syracuse
Chicago
Columbus
Detroit
Grand Rapids
Philadelphia
Pittsburgh
Charlotte, N. C.
Toronto, Canada

Agencies in other principal cities


We Will Help You
AGREEMENT
BETWEEN THE
GALENA SIGNAL OIL COMPANY of Franklin, Pa.

When you make a Galena Contract, you unload your lubricating troubles on us, and we immediately supply you with **the best** oils for each service and take steps to eliminate all lubrication and allied troubles. Naturally, this results in a lower cost, and in any event our guarantee protects you.

Galena-Signal Oil Co.

Franklin, Pa.

Here Are Six Things You Would Like to Have Your Motormen Do

Showing recorder location on one of the cars of the Connecticut Company.

1 Coast more

2 Avoid unnecessary stops and slowdowns.

3 Start and stop smoothly.

4 Release brakes early after stopping on level track.

5 Use hand brakes enough to keep this safety feature in good working order.

6 Operate cautiously and safely.

Equipment of Your Cars with the

Arthur Power-Saving Recorder

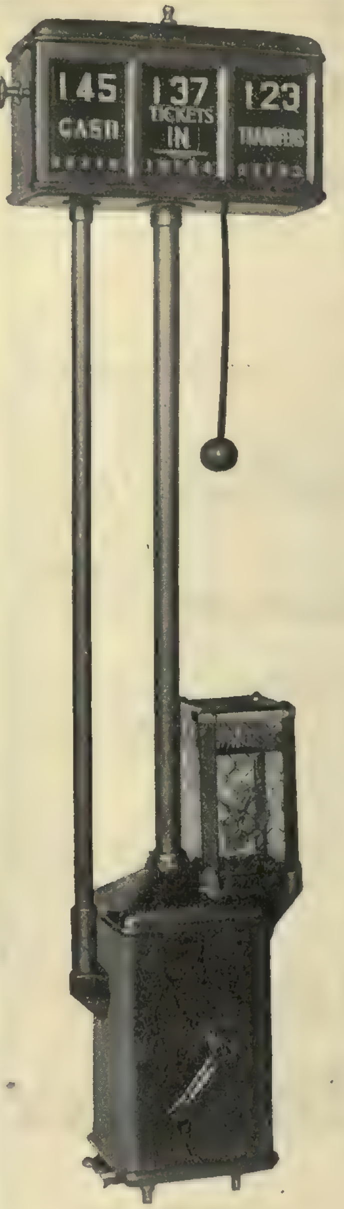
followed by your intelligent interpretation to your men of the meaning of the records established and suggestions for making better records will rapidly educate your men to do these things.

And the results for your company will be big in economies of various kinds as well as in greater safety and better service in general.

We will be glad to demonstrate the accuracy of these statements.

The Arthur Power-Saving Recorder Co.
New Haven, Conn.

"Power wasted at the brake shoes is the true measure of the motormen's relative efficiency."



Type C24 Coin, Metal Ticket and Transfer Register

Have You Considered the Use of Metal Tickets?

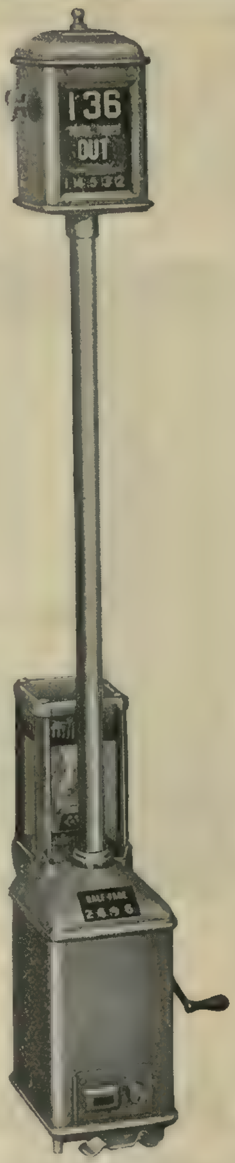
The Lincoln Traction Company, Lincoln, Nebr., were pioneers in their use, and for them we designed the International Type C24 Combined Coin, Metal Ticket and Transfer Register, which went into service April 1, 1915, more than two years ago, and have given continuous, thoroughly satisfactory service since, with increased earnings and better maintained schedules. (See description and practices Lincoln machine page 199, Blake & Jackson's "Electric Railway Transportation.")

The latest road to adopt metal tickets is The Kansas City Railway Company, Kansas City, Mo., from whom we have just received the largest single order for this type of machine ever placed, covering a complete equipment for their cars with the International Type C17 Coin and Metal Ticket Fare Box to be used in connection with International Type R7 Single Register.

The Milwaukee Electric Railway & Light Company have also placed a small order for the same type of box for use at Racine.

The United Railways Company of St. Louis have in use a large number of standard International Coin Registers and Fare Boxes, and the Sioux City Service Company is entirely equipped with International Fare Boxes, where metal tickets of the size and value of a nickel are used.

We illustrate on this page two types of Coin and Metal Ticket Registers and two views of the Coin and Metal Ticket Fare Box, any one of which can be arranged for motor operation if desired.



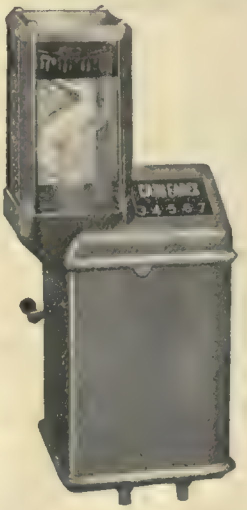
Type C14 Coin and Metal Ticket Register

These are only a few of our many fare collection and registering devices. Send us your problems.

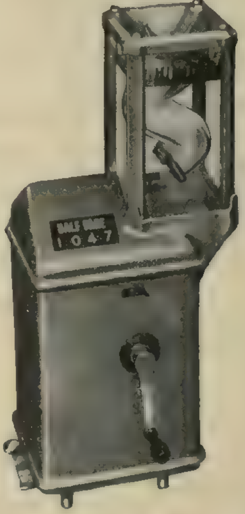
THE INTERNATIONAL REGISTER COMPANY

15 South Throop Street

CHICAGO



Cash Side Type C17 Coin and Metal Ticket Fare Box



Ticket Side Type C17 Coin and Metal Ticket Fare Box

Every Fare Through One Hopper with the Johnson

There's no lost motion—no waste of time in receiving, counting and registering cash fares and metal tickets—on lines using

The Johnson Metal Ticket System

Because the Johnson System handles all classes of fares—nickels, dimes, pennies and metal tickets representing two different rates of fare—through **one** hopper.

Errors, misunderstandings and arguments are cut to the minimum—time required for fare collection is cut at every stop, and schedules correspondingly improved.

Follow the example of many keenly progressive managements, and install the Johnson System. The first step is to ask for fully detailed information—do it today.

Johnson Fare Box Company
Jackson Boulevard and Robey St., Chicago
50 East 42nd Street, New York

Columbia Brake Levers

No. 1

Heating

The first step in the making of our brake levers is the heating of the rough shape preliminary to forging.

It's hot work, done by experts who know the exact blush the iron should take before it is removed from the furnace.

Step No. 2, the forging, will be illustrated next week.

Don't forget that we make many other things besides brake levers. For instance:

TOOLS

- Armature and Axle Straighteners
- Armature shaft straighteners
- Armature buggies and stands
- Babbitting molds
- Bending and heading machines
- Car hoists
- Car replacers
- Coil taping machines for armature leads
- Coil winding machines
- Pinion pullers
- Pit jacks
- Signal or target switches
- Tension stands

CAR EQUIPMENT

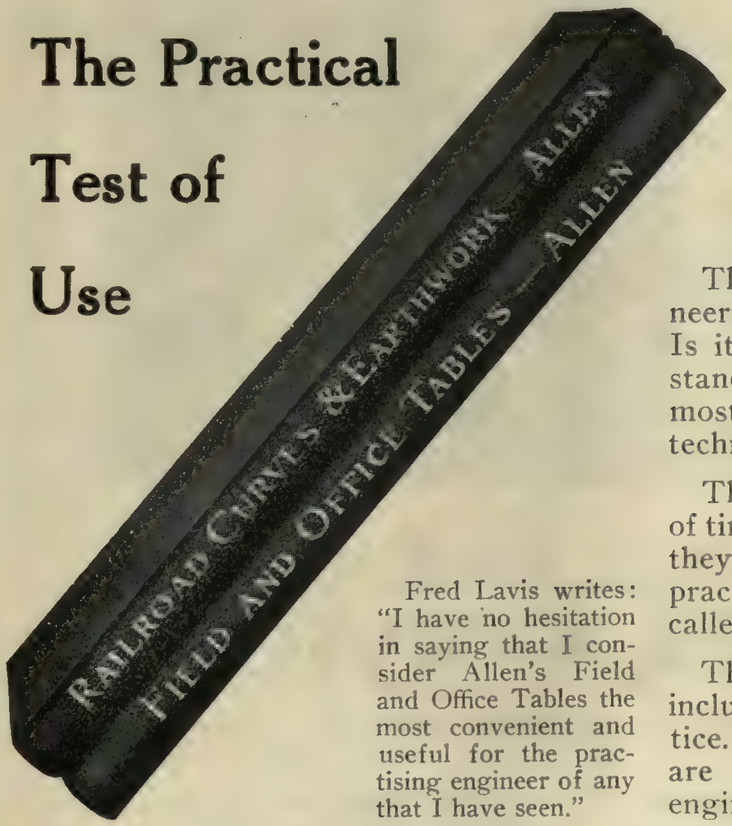
- Armature and Axle Bearings
- Armature and field coils
- Bearings (Axle and Armature)
- Brush-holders and brush-holder springs
- Brake, door and other handles
- Brake forgings, riggings, etc.
- Car trimmings
- Commutators
- Controller handles
- Forgings of all kinds
- Gear cases (steel or mall. iron)
- Grid resistors
- Third-rail shoe beams and accessories
- Trolley poles (steel) and wheels

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St., Brooklyn, N. Y.

W. R. Kerschner Co., Inc., N. Y. Holden & White, Inc., Chicago F. F. Bodler, San Francisco

The Practical Test of Use


RAILROAD CURVES & EARTHWORK ALLEN
FIELD AND OFFICE TABLES — ALLEN

Fred Lavis writes: "I have no hesitation in saying that I consider Allen's Field and Office Tables the most convenient and useful for the practising engineer of any that I have seen."

The true test of the value of an engineering book is its practical usefulness. Is it the volume which is used as the standard work in its field? That is the most frequent question asked about technical books.

The Allen books have stood the test of time and use. Through five revisions they have increasingly proved their practical utility and their title to be called standard.

The volumes have been revised and include the most modern railroad practice. They cover a broad range and are indispensable to every railroad engineer.

Railroad Curves and Earthwork Field and Office Tables

By C. FRANK ALLEN

Professor of Railroad Engineering, Mass. Inst. of Tech.

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One-volume edition:

516 pages, bound in flexible leather, pocket size, gilt edges. Strong, handsome, durable. $3.00 *net, postpaid.*

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RAILROAD CURVES AND EARTHWORK. 234 *pages, $2.00 net, postpaid.*

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Try them out yourself without obligation for ten days.

Send no money —

Just the Coupon

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239 West 39th St., New York, N. Y.**

You may send me on 10 days' approval:

Allen's

..Railroad Curves and Earthwork, $2.00 net.

..Field and Office Tables, $2.00 net.

..Two parts bound as one, $3.00 net.

I agree to pay for the book or return it postpaid within 10 days of receipt.

—— I am a regular subscriber to the Electric Railway Journal.

—— I am a member of A. I. E. E. or A. E. R. A.

(Signed) ....

(Address) ....

....

Reference E-6-30-17

(Not required of subscribers to the Electric Railway Journal or members of A. I. E. E. or A. E. R. A. Books sent on approval to all customers in the U. S. and Canada only.)

The Organization back of
COLLIER SERVICE

In previous advertisements we have dwelt upon the magnitude of the work performed by our large force of solicitors, service men, carders and other workers from Coast to Coast and from Border to Border.

These are the men on the Firing Line, and correspond in a way to the Superintendents, Inspectors, Motormen, Conductors and other employes of the Electric Railway who come in contact with the public.

But back of all these are the Executive, Administrative, Accounting, and Financial departments, each with its necessary complement of workers. These are just as essential to the success of Collier Service as are the similar departments of a large Electric Railway to its successful operation.

The efficient operation of these departments of any well managed large commercial organization involves the expenditure of a substantial percentage of its gross income. These expenses must be considered in our business just as general overhead charges have to be considered in any Electric Railway balance sheet.

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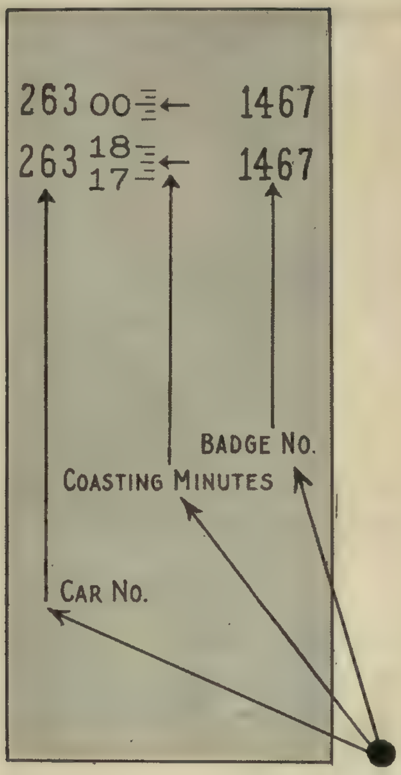

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RECORDING SERVICE INTERRUPTIONS

In connection with attempts by electric railways to sell power to municipalities and large industries located along their transmission lines it has come to our attention recently, in a couple of instances, that the railway companies involved did not have adequate records in regard to the reliability of their service. In consequence they were unable to state definitely what proportion of their troubles was due to their transmission line or to what extent some line betterments they were proposing would be effective in reducing the number and duration of their service interruptions. Our war preparations are only just beginning, but it is becoming increasingly apparent that before they get well under way our factories as well as our transportation systems will be operating under very high tension. Many of these factories are electrically operated, and if they are to perform their allotted tasks their power supply systems must be kept as free as possible from interruptions. For this they depend upon the central station, so that more care than ever should now be taken to maintain this service unimpaired.

POWER TOOLS TO OFFSET LABOR SHORTAGE

"On a job for which there was need of sixty to seventy-five men only about twenty appeared." This quotation from F. H. Hill's track article in this week's issue is similar to reports received from all parts of the country, especially from properties located near the large munitions works. Mr. Hill shows clearly that part of the solution of the labor-shortage problem is found in applying power tools to track work. In the reconstruction work which he describes, the pneumatic machines for cutting asphalt paving, the oxy-acetylene torch for cutting off old track bolts, the steam shovel for excavating the trench, the pneumatic tie tampers, the self-propelled concrete mixer and other pieces of power apparatus were rushed in to take the place of the missing labor, with the result that the second stretch of track was rebuilt at almost double the speed of the first stretch. Of the power-driven apparatus used on this job the pneumatic asphalt-cutting tools are the most novel. These have been used on only a few jobs, but the trials have proved so successful that they are about to take their place as one of the recognized standard track tools on jobs involving the tearing up of paving. Their use is not limited to asphalt paving, but they may be used to good effect also in tearing out block paving and concrete foundations. While the merits of the steam and the electric shovel have long been recognized for many kinds of excavation work, these tools are not as common on electric railway track work as they should be. The excavation work described by Mr. Hill was done at about the rate of 40 cu. yd. per hour under favorable conditions, while the average cost of excavating and loading the material on wagons was 13 cents per cubic yard. Not long ago the Connecticut Company reported that its engineers had cut the cost of excavation 66 2/3 per cent by the use of an electric shovel, which also effected a saving of 50 per cent in the cost of teams. Figures such as these indicate conditions which warrant a more general use of labor-saving equipment.

THE SACRIFICE OF HABIT

It has been said that the greatest sacrifice that this country will have to make for the war—greater by far than the sacrifice of wealth or comfort—is sacrifice of habit. Whether this is literally true or not, there can be no doubt that the disturbance of orderly routine of life which is even now being forced upon the nation will be sweeping. By far the major part of humanity objects instinctively to change—even to change for the better—when long-standing ideas must be uprooted. This attitude more than any other has prevented the introduction of women conductors on the electric railways of this country in times of labor shortage. While old-style cars were being run and a conductor had to be a combined acrobat, bill collector and police officer, as well as a change clerk, women conductors were an absolute impossibility, but the general introduction of prepayment cars eliminated the three first-mentioned duties. To-day there exists nothing to prevent the employment of women on the rear platform except the mental attitude of a public that has become accustomed to tendering fares on electric cars to men. Under ordinary circumstances this custom would, no doubt, be sufficient to exclude women from the work, but now that the government has taken more than 500,000 men into the Army and Navy and is preparing to draft 1,000,000 more workers from their normal occupations within the next year or two, the public has the alternatives of either sacrificing its habit of mind in regard to male conductors or else doing without conductors entirely. The situation is one that can be very definitely predicted. Even to-day there is not a sufficient supply of male labor properly to man the cars. As further demands are made upon the country's man-power conditions will prove more and more acute, and if male labor cannot be obtained, women must be called upon to fill the depleted ranks. Of course, there is no question that the public will sacrifice its mental habit rather than its car service. Electric railways should begin to break the news to the public now, spreading out opposition over as long a period as possible before the change has actually to be made.

WHEN THE PUBLIC UNDERSTANDS The Bay State Street Railway seems to have struck a really sympathetic spot in the hearts of its patrons. Its plea for more financial relief has been heeded, and, as we note elsewhere this week, it will probably have a trial period of six months to see what it can accomplish with a general 6-cent fare unit. The Massachusetts Public Service Commission has not yet approved the company's higher schedules, but that is not the fundamentally important even if it is the necessary legal step. The vital point is that the local public—that very public which during the 1916 fare case was so hostile—has become educated to a better understanding of the electric railway situation. The municipal representatives, it should be noticed, have actively co-operated with the company in determining a plan for the trial period. This undoubtedly will impress the commission as a reasonable solution of the company's case. How has all this been accomplished? Simply by adopting a policy of frankly and persistently stating facts and giving evidence of a desire to please the public. There is no royal road to better public relations. But the way is not excessively long or impassable if a utility operator travels it with intelligence and full appreciation of his public responsibility.

SCHOOLING FOR THE PROSPECTIVE MECHANIC The discussion which has been going on recently in the columns of the *Electrician* of London, England, on the education of apprentices, indicates that conditions in this field in Great Britain are not substantially different from those in our own country. It is very difficult now for a boy to learn a trade in a systematic way, partly because many of the trades are less clearly defined than formerly, and partly because not enough interest is as yet being taken by employers in arranging for the training of boys in such trades as now exist. Our English friends, or at least some of them, believe that boys should, as a rule, leave school at about the end of the grammar grades and go to work under conditions which will stimulate them to learn to think in terms of their daily tasks. The acquiring of useless knowledge is properly deplored, and it is recommended that the studies, to be pursued in shop hours under pay, be in continuation of those begun in school. Such subjects as English, the duty of man to his neighbor and himself, the significant events of history, etc., rather than technical studies, are suggested for these years of adolescence. While we believe thoroughly that a boy headed for the trades should continue through the high school or its equivalent if he is making good use of his opportunities, there are many who would make better progress working under a helpful foreman in a shop. This foreman, however, must have a real interest in the boys' development or they had better be in school. He must have definite plans for them, constituting himself their mentor and friend.

HELP US TELL THE TRUTH

Not long ago the ELECTRIC RAILWAY JOURNAL received an item of interesting information from one of its correspondents concerning the operations of a certain company in an Eastern city, information which was entirely creditable to the management of that company if true. We took the trouble, as we invariably try to do, to approach the company concerned directly to inquire whether the statements set forth in the article were facts. The company immediately replied, with a certain amount of asperity, that the item was partly incorrect and instead of giving the desired information wanted to know from what source we obtained the note.

This experience illustrates an interesting point. Although many companies are making tremendous strides in the development of a publicity policy, some companies still make it extremely difficult for their best friends to tell their story for them. Why should not the management of a company take great pains to tell people of what it is doing? Some managers are inclined to feel as if they were blowing their horn too much if they say much about their affairs. They forget that they are not conducting a personal business. They are, in fact, conducting a quasi-public business—handling funds supplied by the public and rendering a service required by the public. They are therefore required to give an account of their stewardship.

If electric railway managers as a class could really feel deep down in their hearts that the investors in their companies would be pleased above all else at the managers being able to command the confidence of their local communities and the respect and loyalty of their labor, a tremendous change would come over this industry. One of the great difficulties of the business is that so much of the capital in it comes from points outside the community where the capital is used. The business is a local industry, but the capital comes from the money markets of the world. This complication is alike embarrassing to local managers and a constant source of irritation to the local public. Yet it is a fact, inevitable under the circumstances but a fact which should be made an asset with the public rather than a hindrance.

We know of one company which has recently employed a new manager to handle its business in a large city in a neighboring state. The financial backers of his company made this comment upon him: "He is a good, if not a great, operating officer, but above all else, he gains and holds the confidence of the community he serves. You can engage engineering and operating ability in considerable quantity; but the number of managers who really know how to make the public they serve understand them and their company is very, very few."

Does not this situation represent one of the great problems of the electric railway business? Have our managers given enough attention to making their local publics understand them and their companies and their problems? Profoundly as we believe in the fidelity, the courage and the ability with which the electric railways of this country are conducted, we do not believe that the managers have taken enough account of this absolutely vital factor in the success of their business.

As pointed out on another page, the electric railway industry is suffering from an economic disease. Better living on the part of some railways will help the general condition, but in the main the disease can be cured by the public alone. It will be thus cured only as the public is able to make an accurate diagnosis. The public must come to realize that the only possible cure for the disease is to see to it that the electric railways are compensated for the service they render. This lesson in economic pathology is one which can be taught to the public only by the local managers of the electric railways. These men can take no better step in this direction than by arranging to give accurate information to the press and public concerning every phase of their business in which the public may be interested.

WHERE LOCAL ASSOCIATIONS ARE A GOOD THING

Associations which cover a limited section of territory possess some advantages over national associations in handling certain types of problems and in getting quick action from their members and from public bodies. National associations, on the other hand, can by virtue of their representative character exert powerful influence in matters affecting an industry as a whole. Both kinds of associations will get the best results by dividing their work along natural lines.

The endeavor of national bodies to settle purely state questions was amusingly satirized the other day by a veteran electrical engineer in this fashion: Wamba Wumba, delegate from Zululand, in a paper read at the International Humanitarian Congress, declared that the happiness and well-being of the world would be greatly enhanced if the Zulu practices of living in straw huts, eating cocoanuts and wearing nothing in particular were made universal. Strenuous objection to this course was raised by Kama Kamschatka, delegate from North Siberia. In his experience the best style of habitation was a spherical igloo of pure ice, the best food was whale blubber and, as for clothing, three or four thicknesses of seal skin were absolutely essential. Mr. Wamba Wumba's ideas were absolutely fatuous, to put it mildly. Upon motion of a delegate from Mush, the discussion was postponed until next year's convention, largely to avoid the riot which was impending between the adherents of opposing sides.

To bring the matter closer to home it is obvious that a fog test for insulators, of vital importance in California, would not be of much interest in many parts of the country, hence had best be formulated locally. Again, where joint pole agreements are urgently needed the local interests can get together and put plans into operation while the national bodies are struggling with the general problem. This was done around the Golden Gate, where poles are in joint use with circuits of voltages lower than 5000. Still another illustration is furnished by the action of the Central Electric Railway Association in getting together and acting promptly on certain car equipment standards which were greatly needed. All of which goes to indicate that there is plenty of work for vigorous local electric railway associations. In planning their work, however, these should concentrate attention upon their own specific problems, leaving the broad field for the national bodies.

LOSS OF HOME RULE DOES NOT AFFECT PRESENT CHICAGO ARRANGEMENTS

A few weeks ago the Illinois Supreme Court reached a decision which seemed to transfer the regulatory power over the Chicago Surface Lines from the City Council to the State Public Service Commission. To overthrow this decision, the City Council asked the State Legislature to restore jurisdiction to it. Very recently, however, the bill proposed by the City Council was killed when the House committee on public utilities adjourned without taking a vote thereon. This unquestionably leaves the regulation of Chicago's utilities in the hands of the Illinois commission for at least two years, when it may again be possible to introduce the home-rule bill in the Legislature.

Under this control, what is the effect upon the work of the Board of Supervising Engineers—that body which has so excellently supervised the physical properties and the accounting of the surface railways under the 1907 contracts? The answer, we are authoritatively informed, is "practically no effect." The points over which this board has jurisdiction are carefully defined in the city ordinances and in almost every case will be undisturbed by the activities of the State commission. The questions of rate determination, service regulation and capitalization, which are the fundamentals to which the commission will direct its attention, do not come within the local engineering board's supervisory powers.

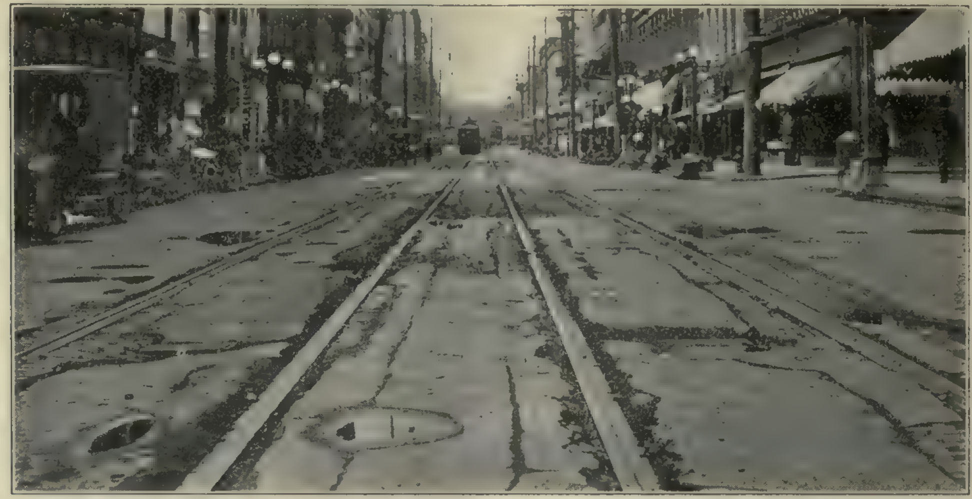
It is just and fitting that a city should exercise through experts a direct administrative supervision over a utility when a partnership agreement has been made, but home rule is by no means necessary for this. The traction ordinance in Kansas City was lately developed in the full light of Chicago experience, and here, by means of the city-and-company board of control, it has been shown how under state regulation a municipality can check operation under ordinance rules and maintain a direct contact with operating details, with receipts and expenses, and with renewals, betterments and extensions. The board of control must take cognizance of any pertinent mandates arising from the superior power of the Missouri commission, but this should involve no duplication of work as long as the local board "sticks to its last."

We see no valid reason why the Board of Supervising Engineers and the Illinois commission cannot work together satisfactorily in this way, thus avoiding the decentralization and the political susceptibility of home rule. We believe the arrangement now in effect has material advantages over the regulatory scheme which would have come with a return of home rule to Chicago. For instance, a fare increase might be granted by the State commission, but it is almost beyond hope that a Chicago City Council would ever do this.

Power Tools Speed Up Track Work

Pneumatic Asphalt Cutting Tools and Tie Tampers, Steam Shovel and Self-Propelled Concrete Mixer Called Out to Help Solve the Labor Problem

By FREDERIC H. HILL
General Manager Elmira Water, Light & Railroad Company, Elmira, N. Y.



ELMIRA TRACK RECONSTRUCTION — FIG. 1 — CONDITION OF TRACK AND PAVING BEFORE RECONSTRUCTION

LESS than two months ago the Elmira Water, Light & Railroad Company completed the reconstruction of about 1900 ft. of double track and paving in connection with which there were employed time and labor-saving devices which enabled us to execute the work with unusual speed and at moderate expense.

LOCATION AND EXTENT OF WORK

The work under consideration was on Lake Street and Water Street in the heart of the retail business section of the city. All cars operate over the tracks which were reconstructed, and vehicle traffic on these streets is also very heavy. Due to the location of the work it was of the utmost importance that it should be pushed with all possible speed. While tracks were torn out not only was traffic on all lines interrupted, with the consequent loss in revenue, but also it was necessary to hold a large proportion of our car equipment out of the carhouse, so that the crippling of a car became a serious matter.

On Lake Street the work consisted in relaying about 550 ft. of double track together with a cross-over and a single-track branch-off. The old construction was 8-in. plain girder rail laid on wood ties without ballast, and the paving consisted of sheet asphalt varying in thickness from 2 in. to 3 in. laid on old Belgian block paving without sub-base.

On Water Street the work consisted of relaying about 1400 ft. of double track, a cross-over, a single-track branch-off and a double track steam railroad crossing. The paving on Water Street was of the same general character as that just described for Lake Street, with the exception that for a short distance the asphalt was laid on a concrete base. The old construction here was 7-in. plain girder rail laid on wood ties without ballast.

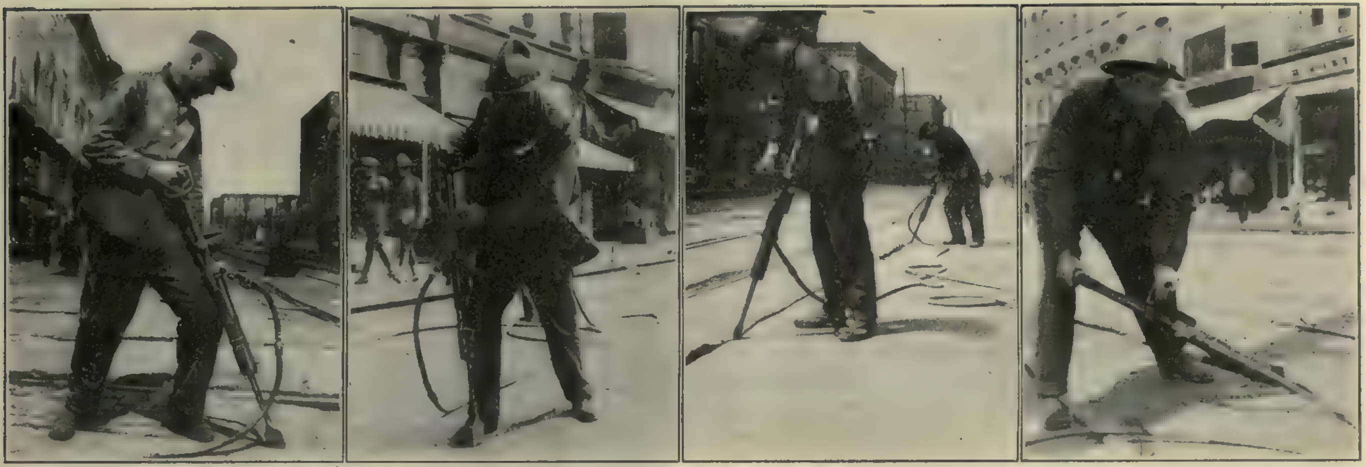
Before any construction was begun, rails, fastenings, ties, paving brick, etc., were distributed along the scene of operations. Rails and ties were distributed from a work car, while two flat cars were used for the 60-ft. rails. The heavy pieces of special work were loaded on a stone drag and hauled to the proper locations by means of a 5-ton motor truck.

The work was begun on Lake Street at 12:30 a.m. Monday, April 2. It had been planned to cut the paving and jack out the track so that excavation could be begun about 7 a.m. On a job for which there was need of sixty to seventy-five men only about twenty appeared, and the progress of getting out track and excavating was so slow that it was most discouraging. The work went on in this manner until Thursday, April 5, when a steam shovel was put to work, and after the men were properly reorganized the work went along very rapidly, so that on Saturday noon, April 7, the excavating was complete. We were further handicapped during this period by cold rains.

It took all the following week to lay rail and repave, so that this section was not completed until Sunday, April 15, a period of fourteen days being required. However, by this time we were well organized with an adequate force of men and tools, and on Sunday at 12.15 a.m. work was begun on Water Street. The condition of the paving before work was begun is shown in Fig. 1, and the work was done in the manner outlined in the following paragraphs.

ASPHALT CUT WITH PNEUMATIC TOOLS

The asphalt paving was first removed from between the rails and for a distance of 24 in. beyond the new line of the outer rails. For this purpose four pneumatic cutting tools were applied in a novel manner. These tools were the standard "Imperial" pneumatic tie tampers, made by the Ingersoll-Rand Company, but they were fitted with special cutting bars, made by changing the shape of the blunt bars used for tamping. This was done by forging the 3-in. by ⅝-in. face of



ELMIRA TRACK RECONSTRUCTION—FIGS. 2 TO 5—SHOWING PROCESS OF CUTTING ASPHALT WITH PNEUMATIC TOOLS

the tamping bar down to an axe-like cutting edge. Another point of difference between the cutting and tamping bar is that the former has a straight shank, whereas the latter is slightly bent.

In beginning the operation of cutting asphalt a notch or shallow groove was first cut along a chalk line drawn at the proper distance from the outer rails and parallel to them. In making this groove the operator slid the cutting edges along the pavement in front of him, guiding the tool with his knee (Fig. 2). It was found that the workman should be discouraged from guiding the tool with his foot (Fig. 3), as this method is slow and there is danger of the operator inflicting serious injury upon himself. After cutting the groove the operator made a series of deeper cuts, leaving 8 in. to 10 in. between cuts, the groove being depended upon to carry the break across these uncut sections. In making this deeper cut the tool was merely placed in the groove, held about vertical and rocked slightly back and forth (Fig. 4). After a few seconds the tool worked far enough into the pavement to enable it to be used as a pry bar, and an occasional prying action (Fig. 5) loosened considerable pavement.

TIME DATA ON ASPHALT CUTTING

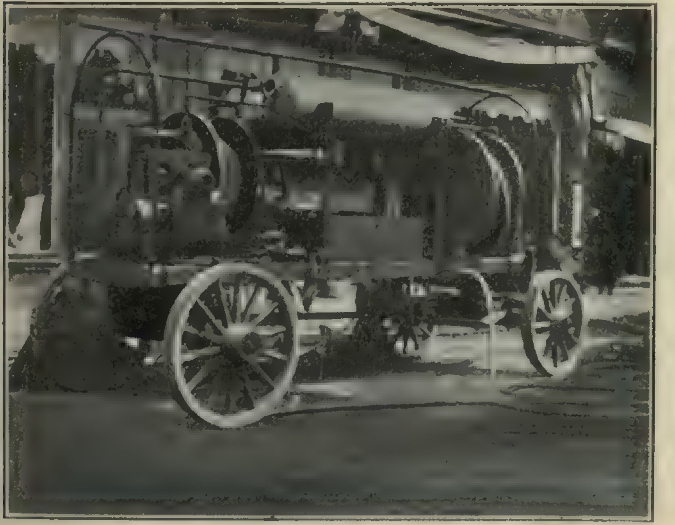
An idea of the cutting speed of these tools can be gained from an observation made while the four tools were in operation, making the outer break in the asphalt. In an hour and one-half a 282-ft. cut was made, which is equivalent to 47 ft. per hour per tool.

In removing the pavement between rails advantage was taken of favorable locations for the cutting, such as along cracks and through thin spots. Good progress was also made by working the tools in pairs. The men faced each other and started the tools down inside of the rails and then pried up simultaneously, thus loosening the pavement from rail to rail. Subsequently the strips were broken up into large chunks. Of course the progress in this varied greatly according to the condition of the pavement, interruptions and the like, but it is safe to say that in a shift of ten hours the average amount of pavement broken up was about 6000 sq. ft. This is equivalent to about 150 sq. ft. per hour per tool. With the aid of a pry-bar the asphalt came up in long strips, which were broken up with mauls into convenient sizes for hand loading.

Where concrete occurred under the asphalt it was cut with the aid of tampers fitted with special picks. These picks were made by tapering and tempering a straight shank similar to that of the asphalt-cutting tools. The concrete was cut along the same line as the asphalt, by holding the tool vertically and rocking it slightly. By inserting the tool at intervals of about 6 in. the concrete was broken up readily. The use of the pneumatic concrete picks was relatively a greater saver of time and labor than for cutting asphalt.

HOME-MADE AIR COMPRESSOR

The air consumption of each pneumatic machine is rated at 16 cu. ft. of free air per minute at a pressure



ELMIRA TRACK RECONSTRUCTION—FIG. 6—HOME-MADE AIR COMPRESSOR

ELMIRA TRACK RECONSTRUCTION—FIG. 7—CONDITION AFTER REMOVAL OF RAILS AND TIES FROM ONE TRACK of 70 lb. per square inch. Air was supplied by a portable equipment mounted on a horse-drawn truck (Fig. 6). Two complete air compressor units were mounted on the truck. Each unit consisted of a direct-connected, electric-motor-driven compressor of the type used on electric railway cars, an automatic governor, a receiving tank and 300 ft. of rubber hose. Each compressor had a piston displacement of 50 cu. ft. of air per minute. The hose was conveniently handled on two old wire reels, and a tool box located between the compressors provided room for tamping bars, tools, oil, etc.

It was considered advisable to adopt a double-unit compressor plant on account of its flexibility. Our large construction jobs are done mostly in the first three months of spring and summer, and after that it is a case of numerous small maintenance jobs. To handle this work it is planned to mount the compressors on work cars, so that two jobs can be carried on simultaneously. Also one unit can be used to furnish air in the shop and carhouse.

After the asphalt was broken up, rail jacks were used at intervals of about 30 ft., and with these the old track was raised about 1 ft. through the broken paving. The nuts on the joint bolts were cut off with an oxy-acetylene blow-torch, using equipment furnished by the Oxweld-Acetylene Company. An operator and helper were able to cut the twelve bolts in a joint in about ninety seconds. Hand cutting with maul and chisel required six or seven minutes, and the edge of the chisel was soon ruined on account of striking the hard steel lock washers. After the nuts had been cut, the bolts were driven out and the fish plates loosened with mauls. With the track jacked up a few blows with mauls on a tie served to pull the spikes. The old rails and ties were then removed (Fig. 7).

ELMIRA TRACK RECONSTRUCTION—FIG. 8—STEAM SHOVEL AND STEAM ROLLER AT WORK; STRETCH OF FINISHED TRACK IN FOREGROUND

STEAM-SHOVEL EXCAVATING

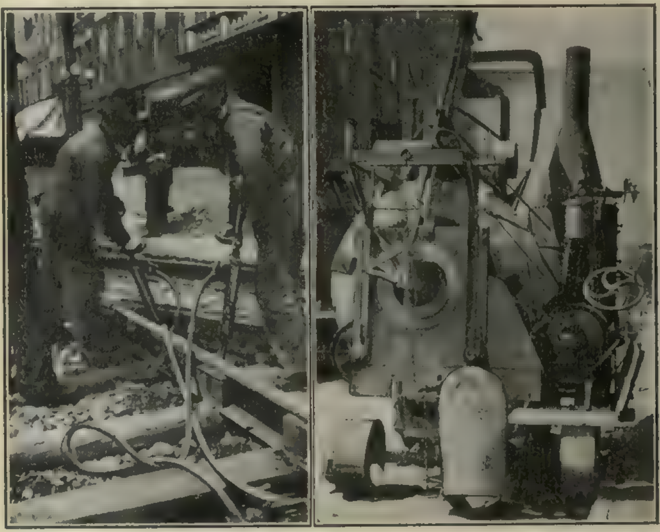
As soon as the first pair of rails and their ties were removed a gang of shovellers began excavating the trench for the new construction. This trench was 20 ft. wide by 20 in. deep. When sufficient length of trench was excavated in this manner a ½-yd. Thew steam shovel (Fig. 8) was run into position, and from there on all excavation except trimming was done by the shovel, the paving blocks and sub-soil being removed by 2-yd. dump wagons. Laborers followed the shovel, trimming the edges of the cut and grading.

Under favorable conditions it was possible to excavate about 35 ft. of trench 20 ft. wide by 20 in. deep per hour, and the average excavation for a ten-hour day was approximately 250 cu. yd. The cost of excavating and loading into wagons averaged about 13 cents per cubic yard. The material was hauled to a dump over a mile from the job, and the total cost of excavating and hauling averaged slightly more than 50 cents per yard.

As soon as the shovel had moved along about 60 ft. a 10-ton steam roller (Fig. 8) was run into the trench and the sub-soil was rolled in readiness for the ballast. After compacting the bed of the trench, oak ties 6 in. x 8 in. x 8 ft. were placed 2 ft. center to center. The new rails were 7-in. Lorain section No. 91-375. One rail of each track was roughly lined in, bolted and spiked. The other rail was then spiked to gage. The spiking was done by a crew of four men. Two, with bars, held the tie up against the rail and the other two drove the spikes with mauls.

BALLASTING WITH PNEUMATIC TAMPERS

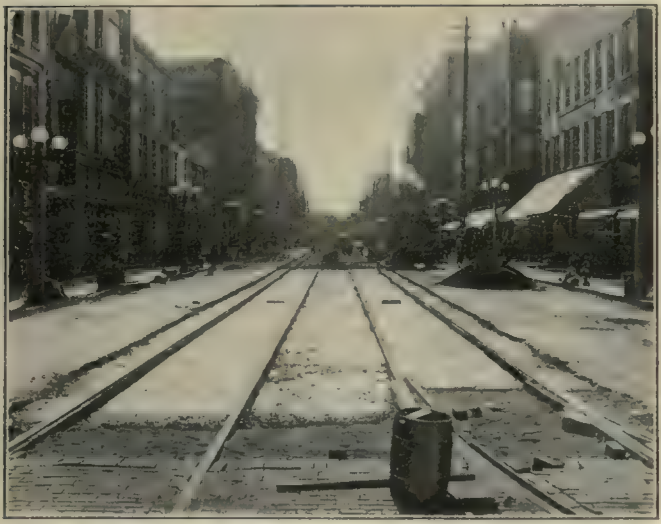
After the spiking was completed the rails were jacked up to grade, leaving space of about 7 in. between the bottom of the ties and the sub-grade. Crushed stone ballast was then shovelled into place and tamped lightly under the ties with shovel and pick. The full length of the ties was tamped with the aid of the same pneumatic tools, which were employed for asphalt and concrete cutting. For this work standard tamping bars with 3-in. by ⅝-in. faces were used with the tools, and the men worked in pairs, one on each side of the tie (Fig. 9). By compacting the ballast from both sides simultaneously none of the force of the blows was spent in shifting the ballast from side to side. Observations made on one section showed that four machines tamped 340 ties in twenty-six consecutive hours. The average time required for two men with the pneumatic tampers to complete the tamping operation of a single tie was from six to seven minutes.



ELMIRA TRACK RECONSTRUCTION—FIGS. 9 AND 10—TIE TAMPING WITH PNEUMATIC MACHINES; SELF-PROPELLED CONCRETE MIXER

In tamping we operated with a gang of five men. The fifth man sounded the ties and watched the grade to see that the work was properly done. He also gave the necessary attention to the compressor plant and tools. Our observations indicate that this five-man gang will do as much work as twenty-four men with picks, and the tamping is better done.

The total time previously mentioned includes all de-



ELMIRA TRACK RECONSTRUCTION—FIG. 11—CONCRETE FOUNDATION, SAND CUSHION AND SPECIAL FILLER PAVING BLOCKS NEXT TO RAILS ON INSIDE OF TRACK

lays incident to the operation. The work was done during a period of high humidity, and considerable trouble was due to the freezing of the tampers. Numerous delays were also experienced on account of men pulling the hose off the connections at the tool. This difficulty was due to inattention on the part of men, and neither this nor freezing was of serious consequence.

While the ties were being tamped the rails were bonded with a Lincoln bonding machine. Coover track braces placed at intervals of about 20 ft. were bolted and then welded to the rail; the welding insured the security of the brace and also improved the cross bonding. Welds were made, using a carbon pencil and scrap copper. Copper wire cross bonds were placed at the end of each section and around all special work.

SELF-PROPELLED CONCRETE MIXER USED

After tamping the ballast extended halfway up the ties and the roadbed was ready for concreting. Before beginning to place the concrete Nelsonville filler blocks were first laid against the web of the rails on the inside of the track, and then the concrete was placed to cover the ties a depth of 2 in. Crushed stone and cement were distributed along the street on one side and sand on the other in estimated quantities. A self-propelled ½-yd. Ransome concrete mixer (Fig. 10) was used on the same side of the street as the stone. A gang of about thirty men were able to concrete 50 lineal feet or about 1000 sq. ft. per hour. The completed concrete base is shown in Fig. 11.

The outside of the T-rails was plastered with cement mortar, and then over the concrete a 1-in. sand cushion was placed. This was rolled with a hand roller and graded, giving a final thickness of about 1 in. The bricks were then laid, using Nelsonville block, next to the filler on the inside of the track. A 5-ton tandem roller was used for final rolling. The spaces between the new pavement and the old asphalt were filled with grout, and pitch was used to fill cracks between bricks. A little sand was sprinkled on the brick and the street was then opened to traffic. A cross-section of the complete construction is shown in Fig. 12.

RESULTS OF USE OF PROPER EQUIPMENT

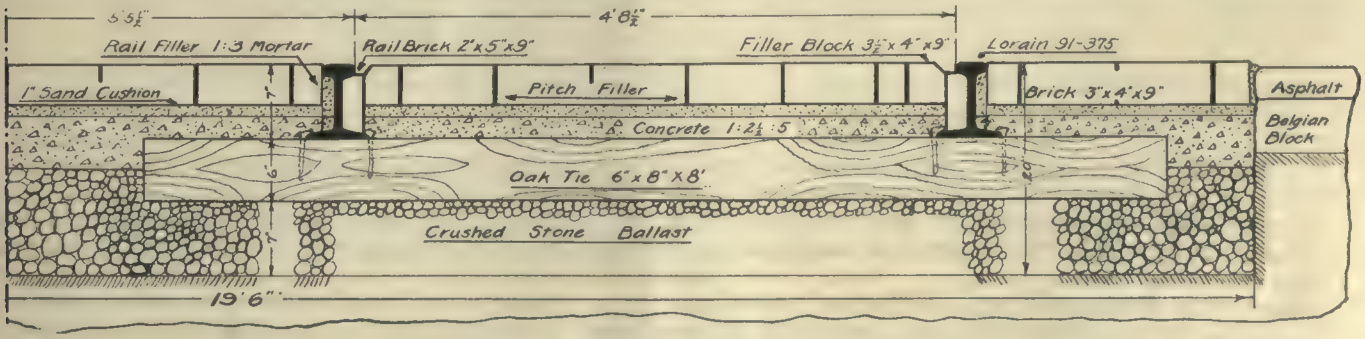
The advantages of suitable equipment and organization are shown clearly by comparing the progress on Lake Street (550 ft. of double track, one cross-over and one single-track branch-off) where fourteen days were required, and on Water Street (1400 ft. of double track, one cross-over, one single-track branch-off and one double-track crossing) where nineteen days were required. The work was carried out by the company's own organization, augmented by laborers and gang bosses temporarily employed for the job. F. G. Maloney, superintendent of the railroad department, had direct charge of the work.

Making the Change to Near-Side Stop Easy for Railway Patrons

A few months ago when the Denver Tramway Company installed the near-side stop throughout the city, it did everything in its power to make this change as easy as possible for the public. In addition to widespread newspaper and company magazine publicity, a white band was painted on the nearest pole at each stopping point. As a still further guide to the riding public, a neatly framed poster was installed on the sidewalk side of each of these poles. This card shows the numbers of the car routes which stop at that location. This was necessary since not all of the cars passing over a certain line stop at every corner. This card gives the number of those routes which do stop at that point and also some general information about what routes run to certain principal points.

NEAR-SIDE STOP POSTER

The Toledo Railways & Light Company, Toledo, Ohio, fittingly observed Flag Day on June 14 by hanging a new American flag, 4 ft. x 2½ ft., on the trolley rope of every one of the 300 cars of the company. As the cars traveled along with the flags waving in the breeze, there was much favorable comment from the people on the streets.



ELMIRA TRACK RECONSTRUCTION—FIG. 12—CROSS-SECTION OF THE NEW CONSTRUCTION

How the Costs of Operation Are Steadily Mounting

Significant Data from Various Parts of the Country Show the Need of Financial Relief for Electric Railways—Business Suffering from an Economic Disaster

By IVY L. LEE

IN the article on this subject last week a general presentation was made of some of the tendencies underlying the street railway business as a whole. It was sought to prove that these tendencies are abnormal and are so undermining the business that, unless heroic measures are taken, inevitable disaster confronts the electric railway industry. No business can continue indefinitely to sell its product at a fixed price if the cost of supplying the product is greater than the price obtained for it.

The point is made in some communities that electric railways are overcapitalized; in others, that the companies have a financial past which is not altogether savory; in others, that the troubles of the companies are due to bad management. It cannot be, however, that these faults are to be found in every company in the country. Yet one may take electric railways almost at random and find the same undermining tendencies at work. Surely this fact indicates that there is something fundamentally wrong with this industry as a business—that the business is suffering from an economic disaster.

The ELECTRIC RAILWAY JOURNAL recently addressed a questionnaire to companies in different parts of the United States, asking for detailed data as to their increased costs of operation. There are published below some significant portions of replies from different parts of the country—sections absolutely independent, surrounded by conditions wholly different, and with stockholders absolutely without relation one to another. These figures show the nature of the economic disease from which the electric railway business is suffering.

A NEW ENGLAND COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of Labor:

The increase in the rates of wages granted to various classes of labor since 1912 are practically as follows: Motormen and conductors, 17 per cent; shop men, including car cleaners, average about 35 per cent (this runs from a maximum of 37 per cent granted to common labor to a minimum of 23 per cent granted to painters); line department, average about 40 per cent, and power station operators, average about 38 per cent.

In the track department it is absolutely impossible to give any definite idea, as common labor in this territory is so scarce that the rate paid depends entirely upon the necessity of the job. The actual rate established at the present time for common labor shows an increase of 60 per cent over 1912, but even with this high increase it is practically impossible to get a sufficient supply of men to perform even the most important work.

The high increases, of course, have been made effective more especially during the last year, due to the activity in all branches of industry throughout the territory. Even with these high rates we have not been able to compete with the munitions factories and other profitable industrial enterprises, and have had to take a less efficient class of labor. For that reason the rates do not reflect the actual cost, for while, as might be expected, a less amount of work has been done in certain lines owing to the excess cost of labor and also to shortage of labor, at the same time work performed has not been done in a satisfactory manner, owing to the decreased efficiency of labor as a whole by reason of the high wage payments and also to our inability to compete with the large industries for the most efficient labor in the territory.

Cost of Materials and Supplies:

Something more than a year ago, in anticipation of the very great increase in the cost of material, we laid in an excess quantity of material and supplies, in nearly all instances the quantity being sufficient to cover the requirements for one year. The following is a tabulation of the increased cost of materials used for various purposes:

	Old Price	New Price	Per Cent Increase
Trolley wheel bushings	$0.13	$0.27	108
Track spikes	2.10	3.65	75
Track bolts	2.80	4.75	70
Tie rods	.23	.60	160
English vermillion	.70	4.00	470
Steel wheels	13.50	23.00	70
White lead in oil	6.50	10.50	60
No. 0000 bonding cable	.11	.40	264
General Electric field coils—80	12.51	27.63	120
General Electric armature coils	21.55	34.38	60
Perfection packing	.12	.20	67
Westinghouse field coils—101	20.66	64.03	210
Westinghouse armature coils	23.32	41.02	75
Trolley wire	.19	.38	100
Wire nails	1.50	3.25	116
Machine bolts, discount off list, per cent	75-10	33	200
General Electric 80 gear	$14.13	$28.00	98
General Electric 80 pinion	3.75	8.37	123
Manila rope	.12½	.24	100
Rails	28.00	40.00	43
Rail bonds, per cent discount	40-2½	plus 5	80
Flags	$1.15	$2.00	74

We have tried to select a few items that would cover the general run of materials necessary to use in maintenance of the various items of the company's property. These figures are not the figures at which our stock is carried at present quoted prices. You will note that these run from a minimum increase of 43 per cent to a maximum increase of 470 per cent in various types of material. As near as we can estimate, however, the average increased cost of material is about 60 per cent.

Cost of Fuel:

Contracts which have been made recently for fuel supply are at a rate of 200 per cent increase over contracts made for a similar class of fuel eighteen months ago. In the interim, however, we have had to obtain a large amount of spot coal to keep an ample supply due to the inability, or disinclination, of various contractors to furnish coal arranged for at lower prices. The average increase in the cost of coal during the worst portions of the year has been 360 per cent. If, however, we are able to obtain fuel supply on the basis of our present contracts the increase would be as shown in these data.

It is only fair to say that in this connection we have spent in the past year more than $1,000,000 in modernizing three of our largest power houses in order that the coal consumption per kilowatt output may be materially reduced. In addition to this, we are now carrying on a very active campaign with our motormen with the view to materially reducing the kilowatt consumption per car-mile operated, in this way hoping to overcome, in a large measure, the tremendous increase in the cost of fuel for power production.

Taxes:

Owing to a change in the tax law of the State, whereby assessment is levied by percentage tax on the gross revenue, we have been fortunate in obtaining a slight decrease in tax payment, amounting to 6 per cent. If, however, there is included as a tax obligations put on the company's property for public improvements, such as renewal and reconstruction of pavement, contributions to new bridges, etc., payments for taxes will be materially increased.

2. Figures, showing how the part of the nickel covering the total cost of operation has increased in the last five years.

The best statements as to the decrease in the value of the nickel is shown by the increase in the operating ratio, not including taxes, this ratio having risen from 63.66 per cent in 1912 to 68.51 per cent in 1916, an increase of 7.6 per cent. It is needless to say that during this period the efforts of every individual connected with the property have been given to the problem of reducing operating costs.

3. Estimates of losses from jitneys and private automobiles.

It is impossible to estimate this item in a territory such as that covered by this company's property. The jitneys are, without doubt, taking a large portion of our revenue. They are showing a constant increase, there being at the present time 562 jitneys in operation in various cities in this territory as compared to an average of 379 for the year ended April 8, 1916, which is the first year they were in operation on this company's property. Of course, there is a tremendous increase in the number of small automobiles throughout the territory.

AN EASTERN COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of labor (platform), 27 per cent in rate per hour; cost of materials and supplies, estimated average increase between 40 per cent and 50 per cent; cost of fuel (power house steaming coal), 73 per cent advance in price per ton; taxes, licenses, etc.: In 1912 they amounted to 9.28 per cent of total operating revenue, in 1916 they amounted to 10.03 per cent of total operating revenue.

Special Expenses Due to Regulation:

The Public Service Commission during the last three years, either by suggestions to the company's officers or after hearing, has ordered improvements which it is estimated have cost the company approximately $750,000.

Cost of Acquiring New Capital:

The rate of interest has not changed materially, but the purchasing power of the money has been shrinking to such an extent as to make increased capital necessary to accomplish a given amount of work. Therefore, the cost of acquiring new capital may be measured in the terms of this increase. *Illustration:* In round numbers, a complete car could be purchased in 1912 for about $5,000, whereas the purchase price to-day for practically the same car is about $8,000.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

Percentage of operating expenses to gross earnings (including depreciation): in 1912, 50.14 per cent; in 1916, 51.08 per cent.

3. Estimates of losses from jitneys and private automobiles.

Jitney traffic started in this city early in 1915. It is estimated that the receipts of the competitive jitneys have, during the last two years, amounted to approximately $150,000, and it is further estimated that approximately $125,000 of this would have come to the railway had it not been for the advent of the jitney.

Private pleasure autos in this city are estimated at 20,000. Assume an estimated diversion of receipts amounting to 20 cents per day from each of these. The estimated total effect per year would be $1,460,000. The total estimated additional amount which the company might have received per year during the last two years, if there had been no competition from jitneys or privately owned pleasure automobiles, is calculated at $1,601,250.

4. Estimate of added burdens under war conditions.

A recent contribution arising under war conditions was $10,000. Salaries being paid former employees who have entered government service is now about $40,000 a year, and the amount is growing daily. Expenses incident to added precautions in the protection of the company's properties will probably amount to $10,000 per year.

The extra expense and inconvenience which we are being subjected to as a result of war conditions, owing to employees entering government service, freight embargoes, deferred deliveries of materials, etc., amount to considerable, but the figure is not readily susceptible of calculation.

A MISSISSIPPI VALLEY COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of Labor:

The wages of trainmen have increased 16.59 per cent from 1912 to 1917. During the same period the wages of track department employees have increased 15 per cent.

Cost of Material and Supplies:

	Per Cent		Per Cent
Cement	38	Steel castings	94
Sand	20	Malleable castings	100
Ties	22	Strip brass	216
Rail	20	Babbitt metal	15
Spikes	68.5	Solder	30
Tool steel	78.5	White lead	82
Magnet wire	150	Linseed oil	140
Tape	7	Turpentine	38
Canvas	82	Trolley cord	45.5
Glass	160	Paper stock for printing transfers	48
Trolley poles	58	Wood pole (line poles)	35
Galvanized wire	75 to 100	Iron pole (line poles)	81
Trolley wire	158		
Lumber	25 to 30		

The cost of other supplies has increased proportionately but those cited indicated the trend of prices.

Cost of Fuel:

The average price of coal for the year 1916 increased 23 per cent over that of 1912. For the five winter months ending March 31, 1917, the average price of coal was 104 per cent greater than that for the year 1912.

Taxes:

Taxes for the year 1916 increased 15.03 per cent over the year 1912.

Cost of Acquiring New Capital:

Under the financial conditions from 1912 to 1917 it was impossible to procure new capital for investment in this company. All additions and improvements to the property have been paid for out of the earnings of the property.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

	1916, Per Cent	1912, Per Cent
Gross operating revenue	100	100
Operating expenses (including depreciation)	65	63.38
Taxes	6.50	5.32
Interest charges (bonds)	20	22.01
Miscellaneous	2.13	.52
Net income	6.37	8.77

The operating expenses (including depreciation) for the year 1916 increased 5.82 per cent compared with the year 1912.

The average fare per passenger for the year 1912 was 3.38 cents and 3.22 cents for 1916, a decrease of 0.16 cent or 4.7 per cent.

3. Estimates of losses from jitneys and private automobiles.

In this city the jitneys are probably not earning more than $500 per day. We have lost in receipts, owing to the increasing use of private automobiles, from $3,000 to $4,000 per day.

4. Estimate of added burdens under war conditions.

We consider the war conditions responsible for the present high prices of all materials. The present agitation for enlistment is making it very difficult to hold our skilled men and to get new men. The abnormal conditions on account of feverish activity in certain lines has largely robbed us of our skilled men, and has created a feeling of unrest among all of our employees.

A NORTHWESTERN COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of Labor:

The average daily wage paid all employees of all departments of this company during the year 1916 was 22.3 per cent greater than during the year 1912. For employees in the transportation, rolling stock, and way and structures departments, the average daily wage in 1916 was 20 per cent in excess of the average wage in 1912. The average wage of trainmen during the first three months of 1917 was 14 per cent in excess of the average wage during the first three months of 1916. The wages of all other employees increased by approximately the same percentage during this period.

Cost of Material and Supplies:

Items constituting approximately 90 per cent of the total purchases made for the railway department during 1915 show that $1,000 worth of supplies purchased in 1915 could have been purchased in 1910 for $775, and would have cost in April, 1916, and December, 1916, $1,180 and $1,410 respectively.

Cost of Fuel:

It is not possible to give a very accurate figure covering the cost of fuel during the years 1912 to 1916, inclusive, as the conditions under which our fuel has been purchased have been changed from time to time. At the present time, however, our coal is costing us 59.8 per cent more than it did last year, and we estimate that this will increase the cost per kilowatt-hour for current used by the railway by about 36 per cent. The figures shown in the table under Question No. 2 do not indicate the full effect of this increase in the cost of power, as during the earlier months of this year we were using coal which had been purchased on earlier and more favorable contracts.

Taxes:

The taxes paid in 1916 were 36.8 per cent greater than those paid in 1912. During this period the tax rate increased 24.8 per cent, the balance of the increase in taxes being due to increase in assessment.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

	Calendar Years, First Three Months		
	1912, Per Cent	1916, Per Cent	1917, Per Cent
Operating revenue	100.0	100.0	100.0
Ordinary operating expenses (including depreciation)	61.8	67.0	74.1
Taxes	7.0	6.5	7.0
Amount available for return on investment	31.2	26.5	18.9

From 1912 to 1916 the amount available for return on investment decreased from $0.312 per dollar of revenue to $0.265 per dollar of revenue, or by about 15 per cent. The first three months of 1917 showed a further decrease in the amount available for return on investment to $0.189 per dollar of revenue, and bearing in mind the fact that during the first part of the year certain materials were purchased on 1916 contracts, and the further fact that the full effect of wage increases has not yet been felt, it seems to us likely that the amount available for return on investment for the calendar year 1917 will be substantially less than $0.189, and not unlikely as low as $0.150.

3. Estimates of losses from jitneys and private automobiles.

During the year 1915 the losses due to competition from jitneys were probably in the neighborhood of $500 a day. At the present time losses due to jitney competition are probably about the same in amount as they were during 1916, or somewhat less than in 1915. The increasing use of private automobiles has, we believe, increased the total loss due to the operation of motor vehicles to an amount in excess of what it was in 1915. The latest available figures which we have indicate a yearly loss, due both to jitneys and private automobiles, amounting to between $800,000 and $1,000,000 a year.

4. Estimate of added burdens under war conditions.

High prices of labor and materials are probably to a considerable extent due to the war, and we anticipate that these prices will probably be further increased in the coming months. The high wages offered semi-skilled workmen in the mechanical trades and the unusual advantages offered to agricultural labor are serving both to limit the number of men seeking employment and to cause some of our older employees to leave the service. Up to the present time we have not lost any considerable number of trainmen by enlistment. It is likely, however, that within a few months the situation will have developed so that a considerable percentage of the men will have entered military service. This, together with the fact that the mechanical trades are offering large inducements, serves to decrease both the quantity and quality of available labor. We also anticipate serious burdens from special taxes.

A COMPANY IN THE MIDDLE WEST

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Wages of car men have advanced approximately 25 per cent from 1912 to 1917; wages of trackmen, 44½ per cent, and wages of shopmen and car men, 40 per cent, Fuel costs have advanced 200 per cent in the last five years. The increase in taxes has been 79.99 per cent. The cost of acquiring new capital in the last five years has advanced 5½ per cent.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

The operating ratio in 1912 was 70.50, and in 1916 58.30. This apparent anomaly is due largely to the increased density of the riding population and to peculiar local conditions obtaining in the years mentioned.

A PACIFIC COAST COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of labor, 9.37 per cent; cost of materials and supplies, 20 per cent; cost of fuel, negligible; taxes, 15 per cent; special expenses due to regulation, 53 per cent; cost of acquiring new capital, none obtained.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

The average increase in total operating expenses to total revenues has been 8.1 per cent.

3. Estimates of losses from jitneys and private automobiles.

These losses have been 25 per cent.

4. Estimates of added burdens under war conditions.

No percentages are available, but the following items figure in these added burdens: Employees joining colors; inability to secure competent men to take their places; wage increases; increased cost of materials and supplies; car shortage, which has crippled normal freight movement.

A SOUTHERN COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

The cost of labor is 30 per cent greater now than five years ago. Our own costs are controlled not only by prices of crude materials, but also by our degree of alertness toward favorable market conditions. Being consumers, our materials and supplies may reveal cost figures quite different from those of other consumers, the element of timely buying being one of considerable importance here. The following rough percentages of increase have been deduced from our own experience:

Copper wire is 50 per cent over the 1912 price, though it was rather high that year; car wheels show a 5 per cent increase, which came on us just this year; brakeshoes, 200 per cent increase, recorded during the last twelve months; motor repair parts, controller parts, lamp parts, etc., about 40 per cent; creosoted pine poles, 75 per cent increase; chestnut poles, 30 per cent increase; steel rails, more than 30 per cent increase; fastenings and points, 75 per cent; lumber, 25 per cent; pole-line hardware, 45 per cent; trucks, 50 per cent; motors, 50 per cent.

We have been protected by contracts on fuel cost, which is a small item with this company, our power being hydroelectric. Due to car shortage in recent months, however, we have had to go into the open market for some fuel and have been compelled to pay as high as 100 per cent increase.

Our tax payments are 36 per cent higher now than five years ago. This will be increased, of course, by war taxes not yet levied.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

Our operating costs have gone from about 50 per cent of our gross income from street railways to about 60 per cent—exclusive, of course, of taxes and interest.

3. Estimates of losses from jitneys and private automobiles.

Losses in receipts, due to jitneys and private automobiles, are estimated at not less than $1,000 a day.

New York Annual Meeting

The New York Electric Railway Association Holds Brief Session and Listens to Discussion on Higher Fares

IN accordance with the practice being followed by other electric railway associations, the New York Electric Railway Association decided some weeks ago not to hold a two-day annual meeting of the usual kind. Instead, the members met at the Hotel Astor, New York, on the morning of June 27 and finished its annual meeting in about an hour. After the regular meeting, Joseph K. Choate, chairman of the committee on higher fares, and Thomas Conway, Jr., Ph.D., of the University of Pennsylvania, Philadelphia, addressed the members of the association on the kind of data which would be required in completing the case which the railways will present to the Public Service Commission, Second District, in their plea for higher fares.

At the regular meeting of the association, a vote was passed authorizing the continuance of the regular committees of the association.

Secretary and Treasurer W. F. Stanton reported cash on hand at the beginning of the year, $3,084; received during the year, $7,452; disbursements, $6,265; balance on June 27, 1917, $4,270.

The committee on nominations, consisting of six past-presidents of the association, presented the following nominations, which received the unanimous approval of the members.

President, Wilbur C. Fisk, president and general manager Hudson & Manhattan Railroad, New York.

First vice-president, Charles F. Hewitt, general manager United Traction Company, Albany, N. Y.

Second vice-president, E. A. Maher, Jr., assistant general manager Third Avenue Railway, New York.

Executive committee: W. O. Wood, Long Island City; T. C. Cherry, Syracuse; H. B. Weatherwax, Albany, and James E. Hewes, Rensselaer, N. Y.

The only paper presented at the meeting was the annual address of the retiring president. An abstract of this address is given in the following paragraphs:

Address of President Barnes

The New York Electric Railway Association is holding this its thirty-fifth annual meeting under the most critical conditions that our country and our industry have ever seen. For the first time within the association's experience of our present membership our country is confronted with war, and war under such conditions as it has never seen, even during Revolutionary days. Corporate and patriotic duties confront each one of us with an intensity and variety such as to leave room for little else, and least of all for the social and light-hearted features with which we have been accustomed to surround our annual conventions. With this thought in mind, your executive committee has felt that the usual annual convention of this association would be out of keeping with the spirit of the times and has decreed instead a brief business meeting for the single purpose of continuing the life and enlarging the usefulness of our association from a strictly professional standpoint. As the meeting is to be brief, so will your president's address be, confining itself merely to a review of the important features of the association year just completed.

Considering first the activities of the association which are directed toward the problems of the nation, your committee on military operation, which reported so splendidly and effectively at the Niagara Falls convention a year ago, has been continued, and the services of your association have through this committee been offered to the National and State governments, and in co-operation with the American Electric Railway Association and other sectional associations to whatever extent and in whatever direction our association or its membership may be used. It will interest you to know that the officials of the Home Defense Board of the State of New York, who are concerned with any transportation problems which may confront the State administration, have expressed interest and gratification in the data which your association has compiled and have announced their intention of availing themselves of the operating organizations of your member companies should the occasion require.

Your committee on standards has accomplished much of a formulative nature in co-operation with the committee on standards of the American Electric Railway Engineering Association and should in the course of the next year be able to report definite recommendations of great value to the member companies.

The committee on taxation and rates of fare has found itself through the logic of circumstances superseded by the work of a committee under the chairmanship of your past-president, Joseph K. Choate, inaugurated through the agency of your association but extended to include non-member companies. This committee has already filed petitions with the Public Service Commissions, setting forth the need of increased revenues and petitioning for the right to make additional charge for service. Predictions as to the outcome are idle, but if thorough, earnest and conscientious effort can achieve the result, then this committee will work out the salvation of our industry in New York State.

As time goes on, and as this country is drawn more closely into the conduct of the great war, new problems will arise to confront the industry. Already many of our men from all branches of the service have answered their country's call, and the problem of filling the ranks of our workers is becoming daily a more difficult one. We must soon, if we do not already, confront the problem of choosing our policies as companies in this important question of keeping full the ranks of our workers so as to serve our resident population in the best possible manner under the changed conditions which we are entering. The use of women in various branches of the service must have our careful consideration, and this consideration should be early, so that when the necessity arises a definite policy as to this employment may be announced. A uniformity of policy among all companies in this matter would be highly desirable.

As we go daily more deeply into the rapidly changing problems which confront us, let us not forget that association and discussion among ourselves is one of the surest means to an understanding and wise solution of our problems, and let us here resolve that the New York Electric Railway Association shall be now, more than ever before, dedicated to its purpose of making us, by interchange of opinion and by investigation and discussion, not only better railroad men but better Americans.

How the War Will Affect Utilities

Henry G. Bradlee Says that Present Situation Will Require All the Ingenuity of Utilities to Meet It Successfully—Suggests Women Operators and One-Man Cars

An analysis of the situation facing public utilities has been made by Henry G. Bradlee, president Stone & Webster Management Association, Boston, Mass. Summarizing the conditions which he believes will prevail during the war, Mr. Bradlee, in the June issue of the *Stone & Webster Journal*, says in part:

"It appears that we may have for the first time in our experience, and continuing during the entire period of the war, a combination of conditions somewhat as follows:

"1. An unprecedented shortage of labor, materials and supplies, and consequently an abnormally high price for those actually available.

"2. No new capital available for extensions and additions to property.

"3. A condition of general industrial activity and prosperity with consequent demands for additional service.

"It is difficult to imagine a more difficult combination of circumstances for a public utility, and it will require the combined ingenuity of the utilities to meet this situation successfully and furnish satisfactory service to the public. The utilities must devise ways and means to hold down their demands for labor and capital, and above all they must, if possible, find some way to provide for increases in business without making any material increase in plant."

Besides urging companies to make a careful study of the most effective use of employees to make up draft deficiencies and to discontinue all operations which can be dispensed with without loss of efficiency or impairment of service, Mr. Bradlee makes the following suggestions:

"The employment of women in the place of men who enter the army or leave for any other cause should be carefully considered. Experience in England and in Canada shows that women may be employed to great advantage in many departments of public utility work. They have been found particularly efficient, it is said, in some of the lighter mechanical work—for example, meter repairs and adjustments.

"The increase of one-man operation of cars should everywhere be encouraged. In England women have been very generally substituted for men as conductors, and it is understood that they are also being used successfully as motormen. In this country one-man operation is already started and has demonstrated its possibilities even on large double-truck cars. We are satisfied that all street railways will gradually change to one-man operation for most, if not all, of their business, and by so doing will be able to improve materially the service rendered the public. Such change at this time will meet our present needs and will be in line with probable future development. One-man operation may, therefore, be considered far preferable to the use of women as conductors.

"An effort should be made to decrease the peak demand on public utility plants and to increase the load factor. As the war progresses, the public will obtain a much clearer knowledge of the needs of the situation, and undoubtedly the utility companies will be able to secure the co-operation of their customers and of the public authorities in their efforts to readjust the demand for peak-load service.

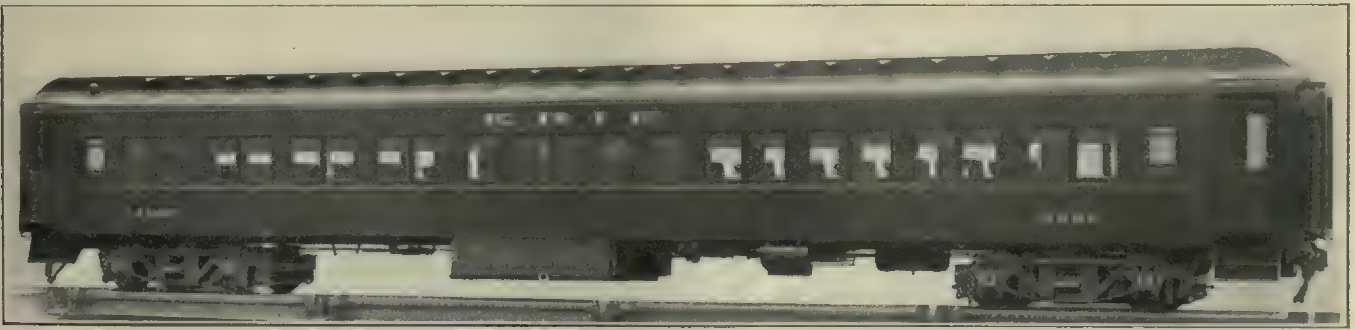
"Renewals and replacements will have to be postponed in so far as this can be done without serious detriment to the service and without permanent injury to the property. This should be done because the cost of all such work at this time is excessive and because the surplus which the utility companies are able to accumulate from earnings may be the only fund on which they can draw for absolutely necessary additions to the property.

"Careful consideration should be given to the study of rates. With the constantly increasing costs of all labor, materials and supplies, general increases in rates may be necessary to permit the companies to carry on business and serve the public. The necessity for an increase in street railway fares is now being urged in many sections of the country, and the public is beginning to realize that some readjustment must be made or service will be seriously impaired."

Non-Telescoping Car for the Erie

Provision Against Disastrous Effects of Collisions Has Been Made by Tying the Sides Together at Floor and Roof with Heavy Plates Connected by Vertical Beams, Making a Complete Box Frame for Either End of the Car

A NEW design of all-steel car recently built for the Erie Railroad presents an especially interesting study because of the notable advance in structural strength that has been effected, the car body having been designed with particular reference to resisting destruction in collision or derailment. This is accomplished by the introduction of two new members in the body end, namely, an anti-telescoping tie member consisting of a heavy plate extending across the car from side wall to side wall and about 5 ft. 6 in. lengthwise of the car, and forming a flat ceiling for the lavatory, passageway and saloon, together with special end-door posts in the form of vertical 21-in. beams. These beams are thoroughly framed into the center sills and to the anti-telescoping plate above with connections capable of developing the full strength of the beam.



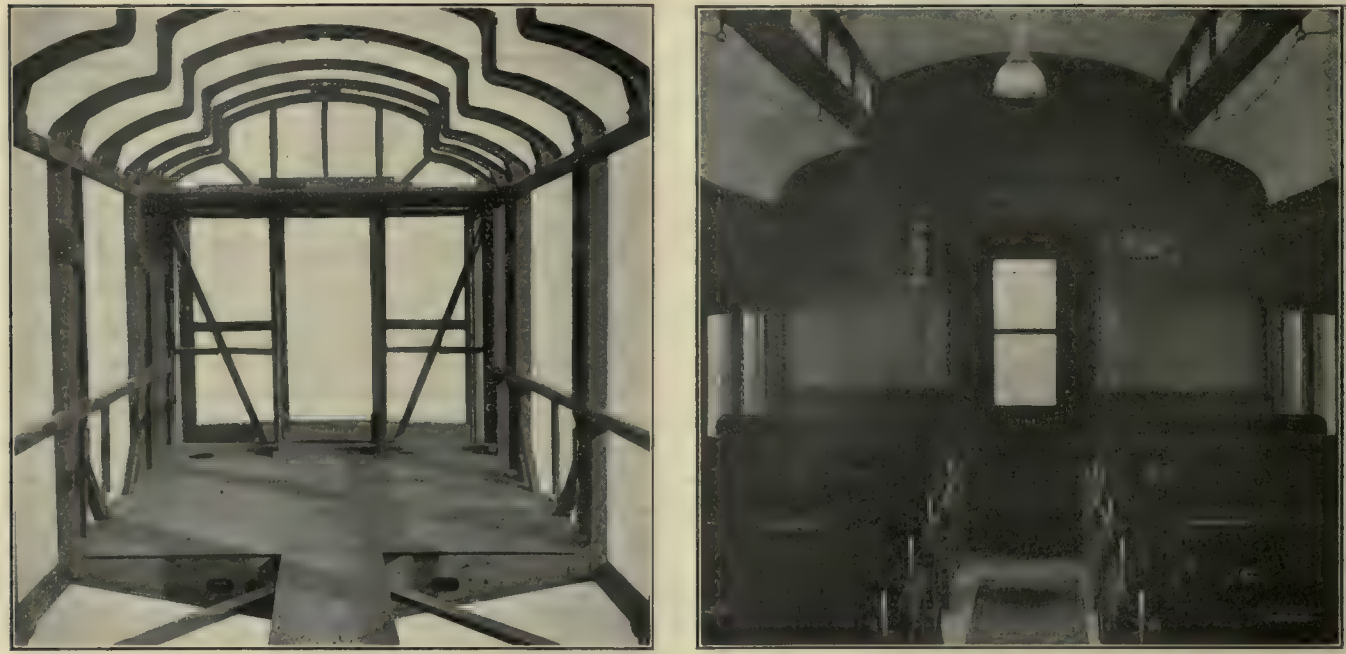
NON-TELESCOPING CAR—EXTERIOR VIEW, SHOWING GENERAL FEATURES

The truss-side-frame construction, which has been used, affords in itself much greater security in the passenger space than is possible with the usual side-girder construction with light side posts and roof, and when to this construction are added the new features incorporated in the latest Erie cars, the result is a structure providing far greater protection against telescoping of the car body than any heretofore produced.

In one of the illustrations on page 1186 the arrangement of the protective members is clearly shown. This is a reproduction of a perspective drawing made to illustrate the manner in which the anti-telescoping plate ties the side walls together at the roof line, and how the heavy door post beams and their backing constitute at each end of the car an anti-telescoping bulkhead of great strength and serve to intercept a colliding body. The vestibules of the Erie cars are of the usual construction and are obviously less capable of resisting impact shock than is the heavy body-end construction. Consequently, if the Erie car is subjected to a violent collision, the vestibule structure may be expected to close up against the body of the car and in doing so somewhat cushion the force of the blow.

Further progress of the colliding body will be greatly checked, if not arrested, by the heavy end construction, and it is confidently expected that the anti-telescoping bulkhead, if generally adopted, will very greatly reduce, if not eliminate, that most common and most destructive feature of collisions—the telescoping of one car by one of its neighbors.

This design is the result of six years' study of the effect of collision or derailment upon cars—particularly all-steel cars—through personal inspections and examinations of photographic records. The inevitable conclusion from examination of such a series of photographic records as are preserved, for example, by the Interstate Commerce Commission, is that the heavy underframe so generally used in steel passenger cars not



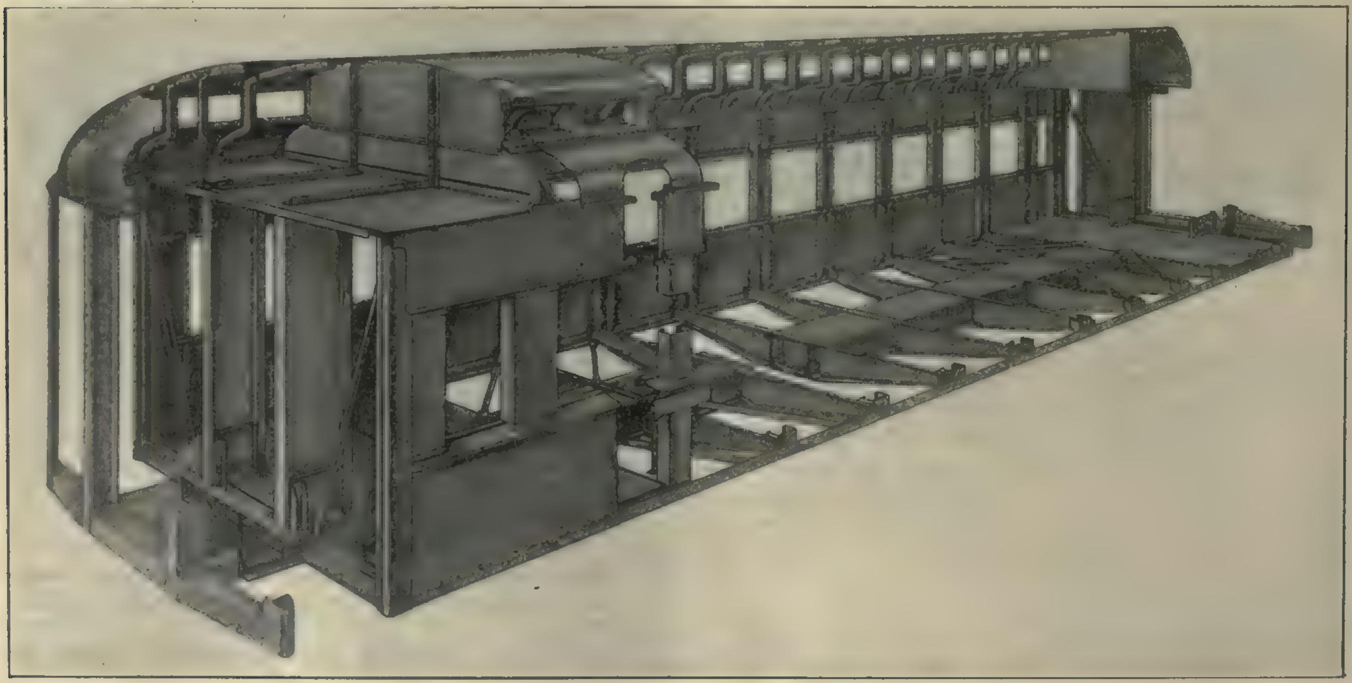
NON-TELESCOPING CAR—INTERIOR VIEWS OF END REINFORCEMENT WHEN UNDER CONSTRUCTION AND IN COMPLETED CAR

only affords little protection against damage in derailment or collision, but in themselves not infrequently increase the damage to life and property, owing to their excessive weight. In case of collision the underframe of at least one car is usually raised at one end above the floor of the adjoining car and, when this occurs, the greater weight and strength of the underframe, as compared to the superstructure of the neighboring car, makes it particularly effective in destroying that superstructure.

This characteristic failure of superstructure when subjected to collision shock has been recognized for several years, and it is to prevent or minimize this destruction, caused by the penetration of one car body within another, that the system of body end reinforcement of the superstructure, as adopted by the Erie Railroad Company has been devised.

The additional weight of material incorporated in this heavy body-end structure is more than offset by the reduction in weight effected elsewhere by the truss-side construction. The complete weight of the car, including trucks but excluding lighting equipment, is only 111,000 lb.—materially less than the weight of the wooden cars with steel underframes now used by the Erie. The length is 78 ft.

For the new cars the framing system is similar to that employed in the Erie suburban cars described in the ELECTRIC RAILWAY JOURNAL for June 12, 1915, except that the windows are rectangular, whereas the window openings of the suburban cars are Gothic. In each case, however, the side sheathing, posts and letterboards, composing the full height of the side walls, are framed together into a truss and act as a load-carrying member. This form of construction produces a structure free from appreciable deflection and without tendency to "work" at joints.



NON-TELESCOPING CAR—CONVENTIONAL REPRESENTATION OF REINFORCEMENT AT CAR ENDS

At the bottom of the side frame of the car is an angle side sill 4 in. x 3½ in. x ⅜ in. The main side posts, or piers, are on approximately 5-ft. 11-in. centers. These piers are "C"-shaped pressings, 12 in. wide x 4⅞ in. deep. The upper member of the side frame, corresponding to the letterboard, is a pressed channel 5¼ in. x 3/16 in. The bracing of the piers is accomplished by riveting to the side sheathing and to the belt rail below the windows, and by the letterboard and upper belt rail above the windows. This method of construction produces a load-carrying truss 7 ft. 7 in. in height by 70 ft. long, with suitable openings for windows, as compared with the usual construction having a plain girder 3 ft. high and 70 ft. long below the window sill.

On the center sills, which are composed of 12-in., 25-lb. channels, is a top cover plate, and the two sills, including bottom flange angles, provide a total area of 27.9 sq. in. The center sills are supported and aligned by the side frame through the body end sills, the bolsters and a number of cross-bearers, which occur at every main pier, or at 5-ft. 11-in. intervals. This, in effect, produces a compression member stiffened by flanges that are 7 ft. in depth and eliminates all possibility of deflection of the center sills in a vertical plane. As a means for bracing against horizontal deflection there are incorporated twelve diagonal braces which extend from center sills to main piers at the cross-bearers. These diagonal braces, with the side sills and cross-bearers, form a horizontal truss brace for the center sills, 9 ft. 9½ in. wide.

Double body bolsters are provided, the upper member consisting of a plate ¼ in. thick. Forward of this cover plate is a floor plate extending to the front edge of the body end sill. This floor plate securely ties together the side sills, end sills and center sills, co-operating with the diagonal braces in preventing any possible horizontal deflection of the underframe.

The roof of the car has been made to co-ordinate with the upper portion of the side walls in such a manner as to act effectively in combination with the previously mentioned anti-telescoping tie member. This resists compression stresses and protects the passenger space in case of overturning of the car through derailment.

MISCELLANEOUS DATA

The seating arrangement of these cars conforms to that of the other Erie cars now in through-line service, in that they are fitted with a smoking compartment which seats twelve passengers in the middle of the car. The walls of the compartment are fitted with leaded glass windows. Seats in the smoking compartment are upholstered in leather, and those in the end compartments are finished in Erie standard plush. The seating capacity of the car is seventy-six, including the twelve seats in the smoking compartment. Each end of the car is fitted with a saloon and lavatory.

Illumination of the car is obtained by ten incandescent lamps set on the center line of the ceiling. The power for lighting comes from an 800-amp.-hr. Wilson storage battery with lead-lined cells. The capacity of this outfit is sufficient to furnish light for the run from Jersey City to Chicago and return without recharging.

The general dimensions of these cars, which were built by the Pressed Steel Car Company, are as shown in the following table:

Length over vestibule end sills	78 ft. 0 in.
Length over vestibule body end sills	70 ft. 0 in.
Wheelbase of trucks	8 ft. 0 in.
Height of car over all	14 ft. 3 in.
Weight of car body	80,660 lb.
Weight of two trucks, including clasp brakes	30,240 lb.
Weight of car without storage batteries	110,900 lb.
Storage batteries, boxes and hangers	8,700 lb.

The general features of the equipment were selected by F. D. Underwood, president Erie Railroad, and the cars were designed under the direct supervision of William Schlafge, general mechanical superintendent of the system, by the firm of L. B. Stillwell, consulting engineers.

Six-Cent Fare Asked in New York State

Twenty-eight Street Railways Outside of New York City File Petitions with Second District Commission for Financial Relief

TWENTY-EIGHT street railways in New York State, outside of the metropolitan district, joined on June 25 and 26 in filing petitions with the Public Service Commission for the Second District asking for an increase in fare from 5 cents to 6 cents. Virtually every city of any size in the State, except New York City and Buffalo, would be affected if the applications for relief should be granted. A conference on the petitions will be held before the commission on July 6.

Similar printed petitions were sent in by these companies: Albany Southern Railroad; Corning & Painted Post Street Railway; Elmira, Corning & Waverly Railway; Elmira Water, Light & Railroad Company; Fishkill Electric Railway; Fonda, Johnstown & Gloversville Railroad; Geneva, Seneca Falls & Auburn Railroad, Inc.; Glen Cove Railroad; Hornell Traction Company; Huntington Railroad; Ithaca Traction Corporation; Kingston Consolidated Railroad; Northport Traction Company; New York & Stamford Railway; Ogdensburg Street Railway; Poughkeepsie City & Wappingers Falls Electric Railway; Waverly, Sayre & Athens Traction Company; Orange County Traction Company; Peekskill Lighting & Railroad Company; Putnam & Westchester Company, and the Hudson River Traction Company.

The petitions of these companies stated that even the increase of 1 cent would be insufficient to yield reasonable compensation; that the increase was arbitrarily adopted because the reports filed with the commission showed without question that it should be granted immediately. The present condition, it was said, is not due to the war, but is the result of a steady tendency, the effect of which must be counteracted or general insolvency, bankruptcy or even dissolution and abandonment, in many cases, must result.

Each petition claimed that after all expenses were deducted from earnings "there will remain so insignificant an amount that if only a mere nominal value be assigned to the property used in the public service, the return will be much less than 8 per cent, which your petitioner believes is the minimum rate of return which will be sufficient to attract the capital required to enable it to comply with its obligations to the public."

Petitions which differed in some respects from the foregoing were received from the Auburn & Syracuse Electric Railroad, Empire United Railways, Inc., Hudson Valley Railway, New York State Railways, Schenectady Railway, United Traction Company and Westchester Street Railroad. In the case of these companies the Public Service Commission was asked not only to grant the 6-cent fare, but to permit the railway proportionately to increase "rates, fares or charges for such other transportation business as may be performed by it," meaning freight and express rates for the most part.

The United Traction Company, Albany, asked not only for a 6-cent fare but also for a 2-cent transfer charge and a double-fare for owl-car service. After presenting detailed revenue and expense statistics in its petition, this company said:

"From Jan. 1 to June 1, 1917, the revenues have increased over the corresponding period of the previous year, but the excess of revenue has been more than offset by the increase in operating expenses. Unless the revenue for 1917 is increased it will be insufficient to pay expenses, making impossible any improvement or extension to the service which is being constantly demanded by the public.

"The decrease in revenues is largely caused by the increased use of automobiles and by auto bus service, and from the fact that there has been no material increase in population. The great increase in operating expenses is caused by the acknowledged increase in the price of labor and materials, assessments for municipal improvements and taxes. There is no immediate prospect of increasing the amount of travel on its lines, or in decreasing the amount of its operating expenses and other disbursements, and relief can come only by way of increased charges for transportation."

In speaking of the petitions, Joseph K. Choate, chairman of the New York Electric Railway Association committee on ways and means to obtain additional revenue, is quoted as saying:

"Of course, the commission will want to consider the case of each particular company, and the individual companies are preparing special facts for detailed presentation to the commission. But there are certain unusual facts underlying the whole industry which apply to one company quite as much as to another. If the companies are to be permitted to maintain a standard of service in accordance with the continual improvements in the art; if they are to be able to extend their service in accordance with the needs of growing communities, it will be absolutely necessary also to deal with the situation as a whole.

"The fundamental fact in the whole situation is that we are not increasing the price of our service. The purchasing power in labor, materials, etc., of the 5 cents paid for the service is so seriously decreased that we are compelled in the interests of our service to attempt an equalization. Even a 6-cent fare under present conditions will not be as valuable to the companies as a 5-cent fare was five years ago."

Cities Favor Six-Cent Fare for Bay State

Tentative Agreement for Trial Period Reached by Company and Municipal Representatives—Commission Approval Expected

A TENTATIVE agreement between the Bay State Street Railway and representatives of Lynn, Fall River and other important municipalities served by it as to a fare increase for a six-months' trial period was reached at a conference with the Massachusetts Public Service Commission in Boston on June 21. As stated in the Electric Railway Journal of June 2, page 998, the commission recently gave the company permission to reopen its 1916 fare case, this step being taken in view of the company's contention that at least $1,489,000 additional revenue is needed yearly.

The tentative agreement now reached with many of the most important municipalities on the system as to the necessity of at least a trial period for a fare increase is likely to lead the commission to approve the proposed changes in tariffs and to obviate the protracted hearings which were a feature of the case last year. Some of the company's most determined opponents of 1916 are now in favor of granting a measure of relief through temporarily increased fares. Such difference of opinion as has appeared has been based mainly upon the terms of the plan in regard to the sale of tickets.

The plan devised at the conference includes a general increase in the fare unit from 5 cents to 6 cents in all the present 5-cent fare zones of the system. By the 1916 decision of the commission the fare unit in the rural and outer suburban districts was fixed at 6 cents, that in the cities remaining at 5 cents. It is now proposed to make all basic fare units 6 cents, supplementing this charge, however, in the city districts by the sale of tickets in books at the rate of 5 cents per ride, with free transfers as at present. The company desires to sell books of twenty tickets for $1 without any time limit, the tickets to be used interchangeably when accompanied by the cover. The company also desires to charge the full 6-cent fare on Sundays, holidays and on Saturday afternoons after 1 o'clock. Some protests were raised as to the institution of the higher fare at the end of the week, but Chairman McLeod said that the time might easily come when an advance of 1 cent in the cost of a street car ride would be a very small factor in the increased cost of outings under war conditions. In general, transfers would be good only within city limits. For the present school children would be charged 3 cents per ride under the new arrangement.

Third Avenue Hearing Continued

June 28 Session Given Up Mostly to Discussion of Valuation—Staten Island Lines Ask Six-Cent Fare

THE 2-cent transfer charge hearing for the Third Avenue Railway, the first of the New York City companies to have its petition for relief taken up by the Public Service Commission for the First District, was continued on June 28. The chief point discussed was the value of the property.

The company had submitted as evidence the physical valuation made by the commission as of Sept. 1, 1909, in the 1910 capitalization case. This involved a valuation figure of $35,100,000 for reproduction cost less depreciation. The city opposed the use of this figure now, on the ground that it is not applicable to a rate case, where only used and useful property instead of all owned property should be considered. The commission seemed to feel, however, that the 1910 inventory was competent evidence, subject to proof as to the listed property being in public service.

The 1910 valuation was made under the direction of E. G. Connette, president United Gas & Electric Corporation, who was at that time transportation engineer for the commission. Testifying in the present case, Mr. Connette said that, if all the property listed in 1910 except real estate is in existence to-day, the present cost of reproduction new (with prices averaged over 1914, 1915 and 1916) will be considerably more than that on Sept. 1, 1909. He was not allowed to state whether in his opinion appreciation since 1909 has been sufficient to offset depreciation.

It was brought out by commission counsel that in the later Manhattan transfer case, Mr. Connette determined the non-operating and non-useful property as of July 31, 1911, to be $7,222,758, and that Mr. Floy, the company's expert, fixed the figure at $6,083,212. The hearing is to be continued on July 9.

The Staten Island & Midland Railway and the Richmond Light & Railroad Company, which control the surface lines on Staten Island, have asked the commission for permission to charge a straight 6-cent fare. It is said that relief must be granted to allow the companies to operate at a profit.

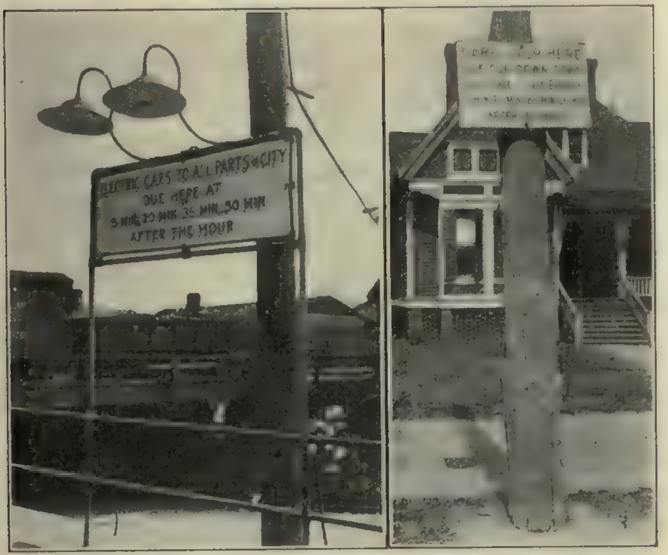
Schedule Boards for Patrons

Displaying of Schedules at Street Intersections Has Proved a Success in Athens, Ga.

BY ROSS L. BAKER
Electrical Engineer H. L. Doherty & Company, New York, N. Y.

ALTHOUGH the application of new business principles to the gas and electric business is causing these branches of public utility operation to grow beyond all bounds, the application of those principles to the railway business has been sadly neglected.

A radical departure has been made by the Athens Railway & Electric Company, Athens, Ga., a subsidiary of the Cities Service Company, in the adoption of a schedule board for location at each street intersection along the company's lines. Examples are shown in the accompanying illustration. These boards, so colored as to attract attention, are attached to the electric railway poles. They should be attached so as to overhang the street, and lettered on both sides so as to be visible from both sidewalks, and, if possible, one block off. The lettering on the boards simply states at the top, "Cars Stop Here," and underneath, "Car Due Northbound," at certain "minutes after the hour." The last phrase is at the bottom of the board. In a parallel column with a "Northbound" column is a "Southbound" column with a minute schedule after the hour.


ELECTRIC CARS TO ALL PARTS OF CITY
DUE HERE AT
5 MIN 20 MIN 35 MIN 50 MIN
AFTER THE HOUR

EXAMPLES OF SCHEDULE BOARDS SUCCESSFULLY USED IN ATHENS, GA.

The Athens boards are experimentally made of wood. They should, by preference, be made wholesale of brightly colored enameled metal, the only painting by hand being the figures for the minute for any given block on the schedule.

These boards have been so successful that no one in the Athens company, from the manager to the motorman, would dream of abandoning them. The advertising value has been very high, and the boards have been very favorably commented on by strangers.

These schedule boards take into account, in a high degree, the psychology of the patron. He comes out of the house in the morning desiring to take a car to town, but there is none in sight. Ordinarily he would stand and wonder whether a car had just left, and how long he would have to wait for the next one. The schedule board sets his doubt at rest, and discourages his usual habit of starting to walk to town and continuing to walk after once started. Becoming familiar with the schedule board through seeing it daily, the patron will soon leave his house just in time to meet the car when due.

The schedule board is particularly needed on a car line having an irregular schedule and one hard for the patron to remember. It is a troublesome process for many men and women to add even easy numbers to twenty-two minutes or forty-three minutes, for instance, after the hour any time during the day and arrive at the time when a car is due. They will not make the effort. Moreover, if the patron desires to take a car from some other corner than the one with which he is most familiar, he is utterly at sea as to when the car is due, or, if he stands along an unaccustomed route, as to how often the car is run. The same feeling is experienced by everyone when standing on the corner in a strange city wondering where the cars go and when.

The schedule board is recommended for any street car line having a headway of ten minutes or longer. It may be located every other block, if the blocks are short. It serves as a motorman's running schedule, and makes a schedule clock for the motorman unnecessary. An accurate watch, however, should be located in a padded compartment, where it will be constantly before his eyes.

An objection which was at first offered to the use of the schedule board is that the rush-hour traffic morning and evening makes it impossible to keep a schedule during those hours. If such is the case, this comes to be well understood, and does not affect the usefulness of the board during about sixteen hours out of eighteen. Another objection has been the possible delay in schedule caused by the holding up of cars at railway crossings. If this is a frequent occurrence, the schedule board can qualify its figures by calling attention to this fact in small print at the bottom.

An interesting development of a schedule-board system would be large illuminated signs overhanging the business district, telling what car line to take to get to interesting parts of the city, such as baseball parks, theaters, depots, colleges, etc., or a large illuminated city map with the car routes shown in colors and interesting points of the city prominently featured.

Employees' Club in Portland, Ore.

The employees of the Portland Railway, Light & Power Company, Portland, Ore., have formed a social club under the name of Employees' Social Club of the Portland Railway, Light & Power Company. The purpose of this club is to handle all social activities of the company. The officers elected for the ensuing year are: B. F. Boynton, who is claim agent of the company, president; C. E. Wagner of the light and power department, first vice-president; Mrs. J. A. Mickelson of the Piedmont division, second vice-president; Stacey Hamilton of the commercial department, temporary secretary. The executive committee consists of Mrs. F. E. Amos, Mrs. W. M. Smith, C. F. Gabler, R. Walker, O. Glenn, H. N. Hall, R. W. Simeral, M. Gay, Miss Rhea Joslyn, R. R. Robley and M. B. Grenfell. It is the announced purpose of the organization "to give the employees and their families a royal good time during the year."

It is significant that the electric utility companies under the management of H. M. Byllesby & Company serve twenty-two municipalities which have, in the past, operated their own generating stations. In every case the municipality has found power purchased from a central station to be more economical than if generated in a city-owned plant, more reliable and efficient, or both.

COMMUNICATION

Illinois Passenger Rates Established by Legislature

East St. Louis & Suburban Railway Company
East St. Louis, Ill., June 19, 1917.

To the Editors:

In a news note in your issue of June 16, you refer to the rate dispute between the steam railroads and the State of Illinois, and say: "The State bases its right to injunction upon the decree of the Illinois Public Service Commission, which permits only a 2-cent rate." The law creating the State Public Utilities Commission of Illinois specifically provides that the commission shall not allow a charge greater than 2 cents per mile. The commission has not, I understand, on its own account made any ruling prohibiting railroads from charging more than 2 cents per mile, but has simply declined to permit a greater charge than this for the reason that the law creating the commission specifically prohibits it from doing so.

I thought you might be under the impression that our commission had made some investigation tending to show that 2 cents per mile is sufficient. As a matter of fact, there has been no occasion for such investigation for the reason just stated.

T. W. Gregory, Assistant Treasurer.

AMERICAN ASSOCIATION NEWS

2462 Subscriptions to Liberty Loan on Chicago "L"

At the meeting of the Chicago Elevated Railroad company section held on June 19 announcement was made that employees had subscribed to $175,500 in 2462 subscriptions. Britton I. Budd, president of the company, addressed the meeting, among other things expressing his appreciation at the outcome of the Liberty Bond campaign. He discussed particularly the subject of team work, its value both to the individual and to the organization, and showed how the ability to get along amicably with his fellow-workers is one of the most valuable assets that man can possess. He demonstrated also that the workers who are keeping the country's industries alive are contributing to the welfare of the country even if they cannot go to the front. Mr. Budd's address was followed with music and amusing recitations. Lieut. M. W. Bridges, former secretary of the section, also spoke with reference to the army. The meeting was attended by 150 members and guests.

Concrete Discussed at Milwaukee Meeting

The speaker at the regular meeting of the Milwaukee Electric Railway & Light Company section, held on June 14, was E. A. Dolan, district engineer Portland Cement Association. The topic was "Concrete and Its Uses." In his address, Mr. Dolan took up the history of concrete, citing a number of cases in which concrete had been used in crude form several thousand years ago. He showed pictures of the first cement mills in this country and also of up-to-date mills, illustrating the stages through which the material must pass from its crude state to the finished product. He also showed a number of colored slides illustrating the different uses that can be made of concrete. In the discussion following the talk, Mr. Dolan answered a number of questions relating particularly to concrete paving and track foundation. A buffet lunch and smoker followed the formal meeting, which was attended by fifty members.

Interesting Westchester Men in Safety

Distribution of a Safety Pamphlet and a Prize Contest for Ideas Have Been of Benefit

With the idea of establishing practical interest in the safety-first movement among the employees of the New York, Westchester & Boston Railway, the company recently distributed among them a pamphlet entitled "The World's Greatest Battle," together with an invitation to submit a short written statement covering (1) that picture in the pamphlet which best illustrated the type of accident most liable to happen in the employee's department; (2) the avoidance of such accidents, and (3) suggested changes or improvements on the company's property tending to decrease accidents in general. A prize of $5 was awarded to the employee in each class of service who submitted the best answers. These classes were made up of office clerks, trainmen, station forces, shopmen, track and building men, linemen, maintainers and telephone men, dispatchers and towermen. The committee on awards consisted of the operating officials of the company, headed by P. W. J. Smith, superintendent, who acted as chairman.

The pamphlet in question, which was published by R. J. Bodmer, Washington, D. C., was particularly notable for the extremely realistic and extremely horrible reproductions of the results of accidents, the author stating that it was written from the workingman's angle —not as a reading proposition, but as a matter of mental impression. According to Mr. Smith's statement practically all of the employees got the impression.

Among the prize winners interest appeared to center on subjects of trespassers, attention when operating switchboards, the maintenance of ladders and the risk of getting clothing caught in machinery. The latter brought about a very definite suggestion on the part of the prize winner in the shop forces, to the effect that counterbalanced belt shifters should be used on all belt-driven machines and that a control for the motor of each motor-driven machine should be close to the operator at all times. Other definite improvements were suggested in connection with the operation of trains at points where pickups of cars are made, these being brought up by the prize-winning trainman, together with comments on other phases of operation wherein a tendency toward carelessness had been growing up on the property.

Forestation Venture by I. T. S.

The Illinois Traction System, Peoria, Ill., has to date planted 30,100 catalpa trees along the company's right-of-way. It is proposed to continue this forestation from year to year with the idea of securing a portion of the ties and fence posts used by the company from its own groves. At the present time these catalpa groves are located at points south of Lincoln and Benld, east of Oakley, west of Cerro Gordo and north of Springfield. The trees are set out on extra right-of-way where they will not interfere with train operation. They vary in height from 18 in. to 24 in. With average growth they should be available for fence post use in about eight years and should be large enough for ties in about ten years. Brief mention of the plan of the company to carry out this work was made in the Electric Railway Journal of April 28, page 796.

Equipment and Maintenance Section

Railway Men Should Get the Benefit of the Other
Man's Ideas and Give Him the Benefit of Theirs
by Reading This Section and Contributing to It

One-Man Safety Car Made from Old Box Car for $700

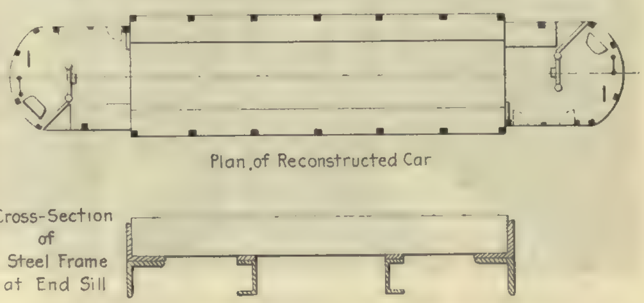
Old Body Was Set in Steel Underframe, Platforms Were Lengthened and Car Was Rehabilitated Generally

BY H. E. WEYMAN
Master Mechanic Levis County Railway, Levis, Province Quebec, Canada.

The Levis County Railway has recently put into very successful operation its first two remodeled "safety" one-man, double-end cars, and its experience with the rejuvenated cars has been so satisfactory that others will be added later. The company had on hand some concave-side, box-type, single-truck cars, about fifteen years old, which were considered good enough to form the basis for modernized cars. They had, of course, small vestibules, bulkheads, etc., as was customary when they were built. The appearance of the old cars is shown in the reproduction of a photograph of one of them, and another photograph shows the present appearance of the two remodeled cars. The principal features of reconstruction were the steel underframes and the lengthening of the vestibules, although all of the details were brought strictly up to date. The work was done under the direction of the writer with the hearty co-operation of A. K. MacCarthy, general manager of the company. The cost for labor and material was approximately $700 per car.

The first operation was the building of the steel underframes, the members of which were as follows: Side sills of 4-in. x 4-in. x 3/8-in. angles, end sills of 3-in. x 5-in. x 3/8-in. angles; cross beams of 7-in., 17¼-lb. channels; outside knees of 4-in. x 4-in. x ½-in. angles; inside knees of 4-in., 7½-lb. channels; bumper beams of 3-in. x 5-in. x 3/8-in. angles. Scraper beams were also attached to the platform knees. The underframe was assembled and riveted together ready for sliding under the box body. It was designed so that the body could be dropped into it without removing anything but the vestibule knees. In other words, the plan was to inclose the old wooden underframe in the steel one, the two to be connected firmly together with angle plates and bolts. After the new underframe was in position the vestibule and body posts were connected to the steel frame by angles riveted at the frame, and when necessary the side posts were connected to the steel frame by angles. Before the new underframe was placed the old vestibule knees and cross beams, which were much the worse for wear, were removed. After the underframe was placed the old vestibules were cut at the body and moved out 15 in., and new pieces of roof were built in. The vestibule bulkheads were cut out, and arches of angle iron, continuous from sill to sill, were inserted to support the ends of the body.

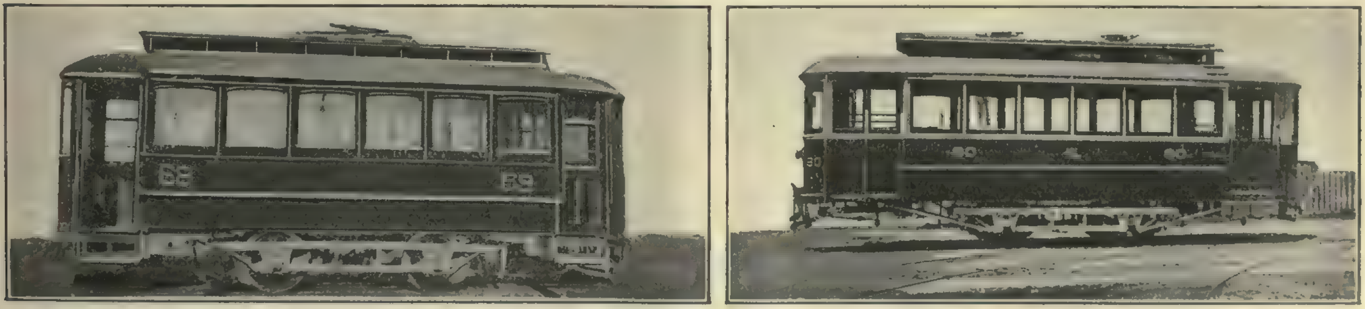
On the right-hand side of each vestibule folding doors replaced the old-style hand doors, and folding steps operating automatically with the doors were installed in place of the old stationary steps. The handles for operating doors and steps were placed near the controllers.


Plan of Reconstructed Car
Cross-Section of Steel Frame at End Sill

GENERAL PLAN AND CROSS-SECTION OF NEW UNDERFRAME OF LEVIS COUNTY RAILWAY REMODELED CAR

The interior of the car was improved by substituting longitudinal seat frames built up of angle-iron for the old wood-inclosed frames, with reduction in fire risk. The new arrangement is also more sanitary, as it is easier to keep the floor clean. On the side of the vestibule opposite to the door a seat for two persons was built in, and on the door side a folding seat was placed, permitting full utilization of the vestibule when the door is not in use. All of the seats were covered with rattan.

With a desire to have a perfectly sanitary car, all of the old grooved and cut moldings were removed and replaced with plain ones. Incidentally this greatly improved the appearance. Rico sanitary strap hangers, push buttons and buzzers, Consolidated car heaters and Atchley staffless brakes were among the devices which we added to make the car as worthy of the name "safety" car as possible. Railings were erected on the platforms to separate the operator from the passengers and also



LEVIS COUNTY RAILWAY CAR BEFORE AND AFTER REMODELING to serve as a support for the fare boxes. Two vertical railing posts were carried clear to the ceiling to serve as guides for the curtains provided to protect the operator from the light behind him. The new arrangement of lamps consists of seven single ones down the center of the car, one in each vestibule, and Golden Glow headlights, one operating at a time. Safety car lighting fixtures were used throughout. All of the wiring was inclosed in flexible or pipe conduits. Finally the car was given an attractive interior finish in mahogany, with cream-enameled ceiling and railings.

The remodeled cars are in operation along the south shore of the St. Lawrence River opposite Quebec. They connect with the Quebec ferry service, which is on a fifteen-minute headway during the summer and a thirty-minute headway during the winter. There is considerable congestion at rush hours, but the cars have handled the business nicely. The company has a total of 14 miles of track, 8 miles of which run west along the river to the now world-famous Quebec bridge. The track is all single and there are grades up to 12 per cent. Unfortunately there are a number of stub-end lines necessitating double-end operation and this required the use of double-end cars.

INTERIOR VIEW OF REMODELED LEVIS COUNTY RAILWAY CAR

Two-Car Train Unit Being Tried Out in New York City

Two-car train operation is being tried out by the Third Avenue Railway of New York City. The experimental unit is made up of two of the company's 43-ft. pay-as-you-enter motor cars, each having a seating capacity of forty-five. The rear door of the front car and the front door of the rear car are used for loading and unloading. The front door of the front car is also used for unloading, but the rear door of the rear car is not used. The three doors are interlocked with the control so that the cars cannot be started until the doors are all closed. The unit is in charge of one motorman and two conductors.

The control equipment consists of a master controller which operates two Westinghouse PK control heads which are applied to the regular type K controllers with which the cars were already equipped. Power for the master controller circuit is furnished by an 18-volt storage battery.

When Does It Pay to Splice Up Scrap Feed Wire?

A Little Algebra Practically Applied Furnishes the Answer—The Author Gives His Experiences on the United Railroads of San Francisco

BY S. L. FOSTER
Chief Electrician United Railroads of San Francisco

In these days of high cost of copper feeder cable its efficient use becomes more important than ever. Hence, in splicing up short pieces of feeder cable, or in fact any copper wire, the question often arises as to how short a length of conductor it pays to splice up rather than to throw it into the scrap. The matter is usually decided arbitrarily by an "educated guess," but it can easily be calculated exactly, as the length in feet of the shortest piece of conductor that can economically be spliced up equals the quotient obtained by dividing the cost of making one splice by the loss per foot sustained in selling weatherproof cable for scrap copper.

The proof of this statement is as follows:

Let $a =$ pounds per foot of new insulated conductor.
$b =$ pounds per foot of same conductor without insulation.
$c =$ cents per pound paid for new insulated conductor.
$d =$ scrap value in cents per pound of bared conductor.
$e =$ number of feet in shortest piece worth splicing.
$f =$ cost in cents of one completed splice.
Then $ac =$ cost of insulated conductor per foot in cents.
$bd =$ selling price of bared conductor per foot in cents.
$bd \div ac =$ portion of a foot of insulated conductor purchasable from proceeds of sale of 1 ft. of bare conductor.
$1 - (bd \div ac) =$ lacking portion of the foot yet to be bought.
$ac[1 - (bd \div ac)] = ac - bd =$ cost in cents of this lack per foot or cents lost per foot on cable sold as scrap.
When $(ac - bd)e = f$, the loss in scrapping the wire will equal the cost of one splice.
or $e = f \div (ac - bd)$.

For example, if a wrapped cable type splice in a 500,000-circ. mil feeder costs $2.21, this same conductor with double-braid weatherproof insulation on it costs 26.5 cents per foot new, and the bare copper sells as scrap for 17 cents per foot. Then $e = 221 \div (26.5 - 17) = 23.3$ ft., the shortest piece that it would pay to splice up.

If the splice had been made with a brass connector and cost only $1 it would have been economical to splice up a piece of cable only 10 ft. long.

All of the items in this simple calculation deserve careful consideration. The difference between the cost of new insulated cable and the scrap value of the copper in old cable is fairly constant in peace times, both in cash and in percentage of cost new, but while percentage remains nearly constant there is a wide difference between peace and war-time cash differences between these two items.

In 1904 double-braid weatherproof 500,000-circ. mil cable cost 15 cents per pound or about 26.5 cents per foot, whereas the bared scrap brought 11 cents per pound or about 17 cents per foot. Here the difference was 9.5 cents. To-day with new weatherproof at 41 cents per pound and scrap at 28 cents this difference amounts to about 29 cents per foot.

This comparison shows how much more extravagant it is for electrical men to be careless in the use of copper conductor when the price is high than when it is low. In 1917 the difference between the new and scrap prices per foot (29 cents) was 40 per cent of the cost of the new cable; in 1904 the difference was 36 per cent.

The cost of a splice in 500,000-circ. mil cable depends on how and by what priced men it is made. In San Francisco a 500,000-circ. mil splice is made with a one-piece brass sleeve connector, costing 52 cents in 1917, without shortening of the cable and with a minimum of labor, solder and tape. It is almost always made on the ground and can be handled by ground men just as well as by high-priced linemen. In Eastern practice the wrapped-cable type splice usually made, and which is always made by linemen, involves a shortening of the cable by 2 ft. (1 ft. at the end of one cable bared, unlaid, scraped and matched into the similarly prepared wires of a foot of the other cable end). Then about twice as much solder and twelve times as much money for labor are required. On actual competitive tests in San Francisco the Eastern wrapped cable splice in 500,000-circ. mil cable cost 12.4 times as much for labor as the San Francisco sleeve splice. The finished wrapped splice cost $2.21 and the one-piece brass splice 94.5 cents, considering labor and material, in 1904. In 1917 the costs in San Francisco would be $3.47 and $1.01 respectively on account of the rise in cost of copper and solder.

From these figures it is seen by applying the formula derived earlier that the least length of 500,000-circ. mil cable that it would pay to splice up in 1904 would have been 23.4 ft. by the wrapped cable-type splice, and 10 ft. by the San Francisco connector splice. In 1917 the least length by the former would be 11.94 and by the latter 3.4 ft.

If shorter pieces than the above are spliced up, the cost of splicing will amount to more than it would cost to scrap the pieces of cable and buy new wire equal to the total length of the pieces.

$387 SAVED BY ONE APPLICATION OF FORMULA

An application of this formula arose recently when copper thieves took down 1900 ft. of 500,000-circ. mil cable on an outlying line after the cars had stopped running. On the following night company detectives, prowling around the vicinity, surprised the thieves digging the stolen conductor out of the sand. They had cut it into 162 short pieces varying from 4 ft. to 20 ft. in length.

There were three ways of replacing that 1900-ft. gap in the feeder line. These 162 short pieces could have been sold as scrap and 1900 ft. of new double-braid weatherproof cable bought, the pieces could have been spliced up by the wrapped cable-type splice method and the resultant shortening replaced by new cable, or it could have been spliced up by the San Francisco one-piece connector non-shortening method.

At ruling rates of 41 cents for new cable and 28 cents per pound for scrap copper the first plan would have cost $551.29 net. At $3.47 each per wrapped splice, splicing up the 162 short pieces and one 328-ft. piece of new cable would have cost $568.59. At $1.01 each per San Francisco splice and no shortening of the cable, the splicing would have cost $164.63.

The last method was followed, with a saving of $387 and $404 respectively over the first and second methods, besides a saving in time involved in making the splices and in not having to wait for delivery of new cable called for to replace shortening. If the wrapped cable splice or second method had been used it would have cost $17 more than selling the 162 pieces as scrap and buying new cable, and besides would have left the feeder full of unsightly splices.

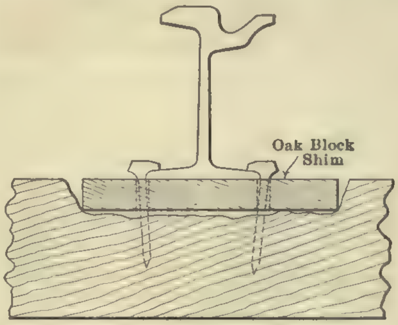
The same logic would apply to 162 short pieces of 500,000-circ. mil cable in the linemen's quarters or the storeroom, or to any number of pieces, or to any other size of conductor. If this splicing of scrap could be done by emergency crews which would otherwise be idle the cost per splice would be less and the minimum economical length of piece worth splicing would be less. Those interested will find this twenty-four-year-old San Francisco splicer fully described and illustrated in the ELECTRIC RAILWAY JOURNAL of Nov. 8, 1915, page 955.

In 1904 the San Francisco order was "Splice up 500,000-circ. mil cable from pieces as short as 10 ft. Scrap all shorter than 10 ft." In 1917 the 10 ft. was changed to 5 ft. as a minimum.

Oak Shims Used in Track Rehabilitation

That worn-out rails on a good foundation can be replaced with second-hand rails with several years' wear left in them, thus avoiding tearing out the ties, is illustrated by a job done on a section of track about a mile in length on the lines of the New York State Railways, Rochester, N. Y.

As the ties were somewhat rotted under the rail but were otherwise in good condition, the bad portion was adzed out and an oak block shim was inserted, as shown in the accompanying sketch. The blocks were made 12 in. or 15 in. long by 6 in. wide and of different thicknesses. They were bored so as not to be split by the track spikes. In doing the work it was necessary only to take out the pavement, the foundation being left in place. The paving was readily replaced, but if the ties



CROSS-SECTION SHOWING OAK SHIM

CONDITION OF TRACK AND PAVEMENT THREE YEARS AFTER RAILS WERE REPLACED BY AID OF OAK SHIMS had been torn out the cost of the work would, of course, have been much greater.

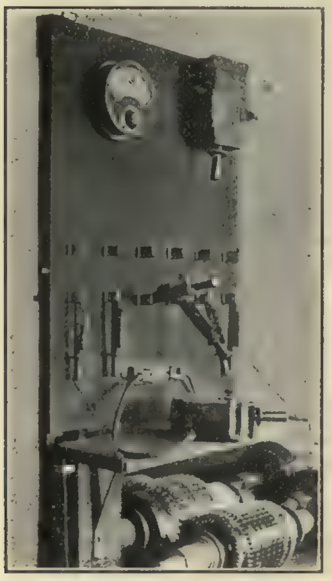
The track was replaced in this manner three years ago, and as may be seen from the accompanying illustration the track and paving are both in good shape.

Home-Made Equipment for Circuit-Breaker Testing

A Neat and Convenient Equipment for Performing a Routine Test with Speed and Precision

BY W. P. LISH
Master Mechanic Fitchburg & Leominster Street Railway, Leominster, Mass.

To facilitate the rapid testing of circuit breakers, the installation shown in the accompanying views was recently made under the writer's direction at the repair shops of this company. In brief, the apparatus consists of a group of six General Electric No. 6 type cast-grid resistors connected with six quick-break knife switches which are mounted on a panelboard of asbestos wood and wired to enable various loads to be placed on the breaker under test. The maximum capacity of the first two switches, counting from left to right, is 200 amp. each, while that of the last four is 300 amp. each. The panelboard is 4 ft. high, 3 ft. wide and 1¼ in. thick; it carries a folding shelf which is 12 in. long, 3 in. wide and 1 in. thick and on which the breaker under test is placed. Flexible No. 2 cable of the type used in motor leads connects the breaker with the supply circuit at the terminals shown in the center of the board. By closing successive switches, corresponding grids may be cut out of the circuit as indicated in the wiring diagram, giving a range of from 150 to 400 amp. The ammeter shown, a General Electric instrument reading to 400 amp., is connected into the supply circuit by the usual shunt arrangement; and a main circuit breaker permanently in service on the panel and normally set at 450 amp. protects the line.

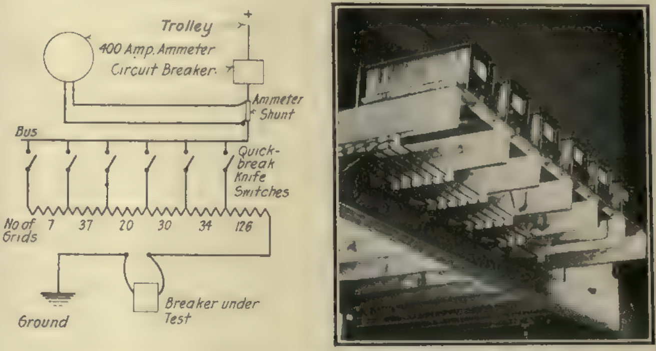


SWITCHBOARD FOR CIRCUIT-BREAKER TEST

It will be seen from the diagram that the final section of resistance always remains in the circuit, so that even if the tested breaker should be short-circuited when voltage is applied to the test wiring, the current will not exceed 400 amp. at 600 volts. The installation is within about 100 yd. of the company's power plant. In the resistance group are a total of 254 grids, the number being indicated in each unit on the drawing. The rheostat rods are much longer than in normal car service, being 31 in. in length by ⅝ in. in diameter, while the bolts are 30 in. long and ½ in. in diameter.

In testing a breaker to be used with four GE-80 or four GE-67 motors, all but the two right-hand switches will be closed. The next to the last switch is then closed, and the current becomes about 350 amp. The breaker should remain closed until the last switch in the group is closed, when the current rises to about 380 amp., depending on the line voltage. The breaker should open under this load. In other words, the breaker for the foregoing motor service should open at a load exceeding that resulting from closing the fifth switch of the group, working from left to right. For use with four Westinghouse 12A motors, a tested breaker should open when the fifth switch is closed, but should remain closed when the fourth switch is closed, the currents being about 350 and 270 amp., respectively. Circuit-breaker adjustments for opening can be made at top speed with this equipment, which, it may be said, contains no new principles, but which represents a very convenient application of well-known wiring arrangements.

One or two other points in the construction of this apparatus may be noted. The panel is supported by four horizontal iron clamps and a brace strap of 2 in. by ⅜ in. fastened to the post carrying the ceiling beams. The resistors are mounted on seven 1¾-in. x 8-in. spruce timbers bedded on a ceiling beam under a small stockroom floor as shown, the timbers being about 6 ft. long and covering a space about 10 ft. wide. Two copper clips are provided on the edges of the panel to hold the test terminals free from the shelf when not in use, the shelf also being held in position by small chains when testing is under way. The resistors are insulated from their supporting timbers, and fiber bushings are applied to the test contacts near their ends to protect the operator. By the use of extra sleeves the terminals can be quickly plugged into either size of breaker used by the company. Arcing under test, which might scar the panel, is prevented by a 2¾-in. x 8-in. x 12-in. asbestos panel shield placed between the test contacts and the breaker. Fuses can also be readily tested with this equipment.



WIRING DIAGRAM FOR CIRCUIT-BREAKER TEST; VIEW OF RESISTORS MOUNTED IN PLACE

Armature Shafts Repaired by Welding on Steel Tubing

The Elmira Water, Light & Railroad Company is using a novel method of repairing worn armature shafts on the commutator end. Steel tubing is purchased which has an outside diameter equal to that of an unworn armature shaft plus a very thin skin cut. The worn shaft is turned down so that the tubing can be put over it with a shrink fit.

To insure a tight fit between the sleeve and the shaft a circular groove is cut in the end of the shaft along the joint between the steel sleeve and the shaft. This groove is then welded full of metal and the shrink fit and the weld give the required strength.

The Union Traction Company of Indiana maintains at Anderson, near the shops, a greenhouse to accommodate the plants and flowers used at the company's park and station grounds. The greenhouse is in charge of the head gardener, and furnishes accommodation for the storage of roots during the winter.

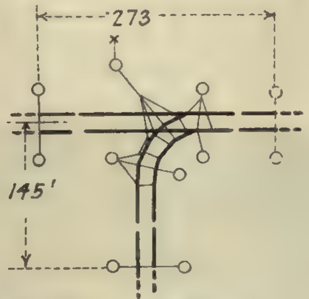
Cost of Erecting Overhead Work—XI

(From the records of a large Eastern company)

The following is the eleventh group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; March 31, page 606; April 14, page 702; May 12, page 880; May 26, page 969, and June 16, page 1105. This is the final group of the series of plates showing the costs of erecting overhead work.

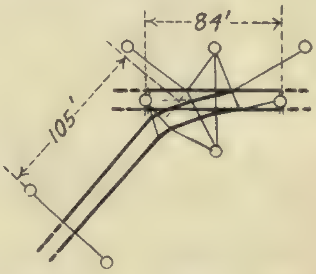
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track left hand branch-off, angle 90 deg.



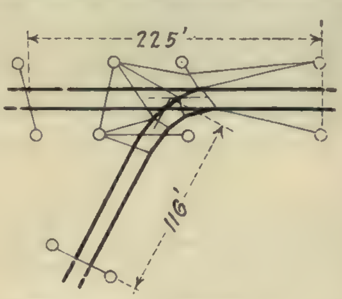
No.	Light Labor	Light Trucking	Ordinary Labor	Ordinary Trucking	Congested Labor	Congested Trucking
77*	$32.67	$23.76	$39.93	$29.04	$47.19	$34.32

Double track left hand branch-off, angle 45 deg.



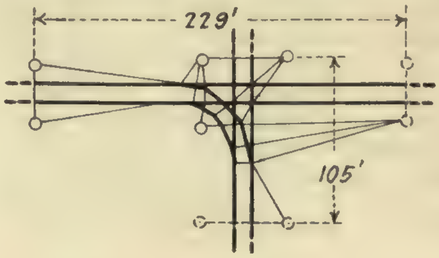
No.	Light Labor	Light Trucking	Ordinary Labor	Ordinary Trucking	Congested Labor	Congested Trucking
78	$23.93	$9.90	$28.71	$11.88	$35.09	$14.52

Double track left hand branch-off, angle 60 deg.



No.	Light Labor	Light Trucking	Ordinary Labor	Ordinary Trucking	Congested Labor	Congested Trucking
79*	$36.30	$26.40	$43.56	$31.68	$50.82	$36.96

Double track crossing double track with double track connecting curve angle 90 deg.



No.	Light Labor	Light Trucking	Ordinary Labor	Ordinary Trucking	Congested Labor	Congested Trucking
80*	$36.30	$26.40	$45.38	$33.00	$54.45	$39.60

*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Costs of Installing Special Work to Begin in an Early Issue

M. Bernard, assistant engineer way and structures department Brooklyn (N. Y.) Rapid Transit System, will contribute a series of plates giving the cost of installing different types of special work. The figures have been compiled from a large number of representative jobs, and sufficient details will be given to allow track men to compare these costs with those on their own systems.

Waterproofing Rail Joints with Asphaltum

BY A. L. KALLOCH
Secretary Austin (Tex.) Street Railway

As a means of increasing the life of our track joints we are experimenting with the use of pitch as a means of sealing the joints against water. After the concrete base for the track has been poured, and before the bricks are placed, we dam up around the joints completely, except for one small opening into which hot pitch is poured. This pitch is what is known as grade "D" asphaltum (melting point, 175 deg. Fahr.), purchased from the Magnolia Petroleum Company. It is heated so that it is very thin and when poured will run into every small cavity and completely fill the space between the angle bar and the rail.

This pitch is of such consistency that in cold weather it does not become brittle, and during the excessive heat which we have in this section of the country, even though it becomes hot enough to melt and run, it cannot get out of the joint on account of the grout filler used in placing the brick. The cost per joint for labor and material, averaged over those which we have already put in, is 16 cents.

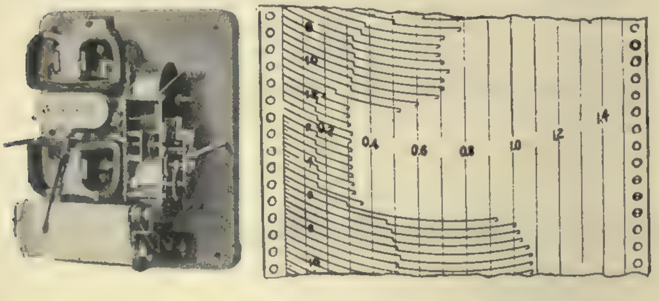
The track on which this experiment is being made is laid with 72-lb., 6-in. T-rail. International steel ties at all joints. Straight six-bolt angle bars and drive-fit bolts are used.

While we are unable at this time to give any data on the real worth of this construction since we have had it in use less than a year, yet we feel that this method will at least be effective in keeping water out of the joints.

Recording-Demand Watt-Hour Meter

In order to avoid having the commercial peak load occur simultaneously with the railway peak on railways selling large amounts of energy, it is often desirable to fix the rates according to the time of occurrence, the duration and the amount of the maximum demand. To determine these factors a meter has been developed which indicates on a four-counter dial the total kilowatt-hours consumed, and records on a paper strip the total energy used over successive predetermined time intervals. The instrument is installed as an ordinary watt-hour meter and requires no additional apparatus or wiring.

Under load the gear train of the watt-hour meter advances the counter in the regular manner. At the same time the ink-carrying pen is caused to advance across the record paper in proportion to the energy used. At the end of a predetermined time interval a stud on a reset wheel releases the pen gear from mesh with the gear train and a balancing weight returns the pen to zero, where it is again meshed with the gear train to repeat its advance during the next time interval. An operating spring controlled by the clock causes the record paper to advance 1/16 in. every fifteen minutes. Thus if the meter is arranged to record the demand at fifteen-minute intervals, the paper advances just before the pen is reset so that the pen makes a distinct and readily-observed record at the maximum point of its travel. This shows both the amount of the energy used during the interval and, by the time calibrations printed on the record paper, the time of its occurrence.

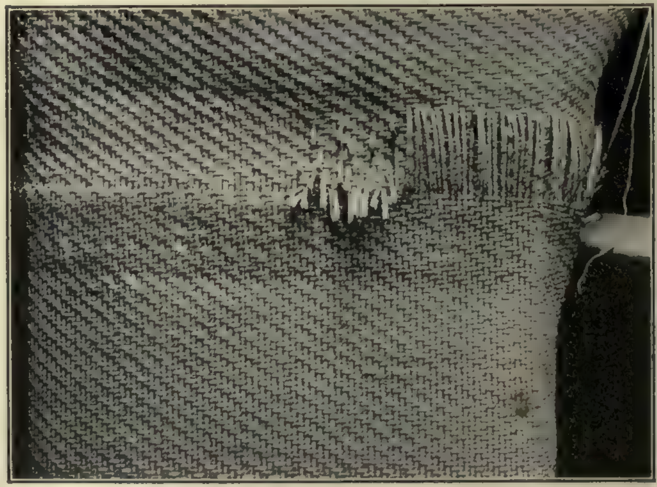


RECORDING-DEMAND WATT-HOUR METER AND SAMPLE OF RECORD MADE

The meter is the product of the Westinghouse Electric & Manufacturing Company and is known as the type RA recording-demand watt-hour meter.

Maintenance of Rattan Seating

In the shops of the Beaver Valley Traction Company, New Brighton, Pa., it is the practice to repair worn rattan seats by splicing in new strips as shown in the accompanying illustration. In this case the total cost of the job, including the labor and material necessary to splice in a 2-ft. strip of rattan, was $1.84, whereas if the 8-ft. seat had been entirely recovered with rattan at 24 cents a foot it would have cost $6.18. The only tools required in doing the work are a sack tier needle and a small pair of pliers.



METHOD OF SPLICING RATTAN SEATING, BEAVER VALLEY TRACTION COMPANY

The following formula is used as a mixture for cleaning the seats in the shops:

Aqua ammonia	2 oz.
Soft water	1 qt.
Saltpeter	1 large teaspoonful
Ivory soap, shaved	1 oz.

The soap is thoroughly dissolved in hot water and then the saltpeter and ammonia are mixed in. This is applied with the ordinary scrubbing brush, after which the seats are rinsed off in clear water.

F. R. Fox, master mechanic Toledo & Indiana Railroad, Stryker, Ohio, reports that this spring the company equipped all of its cars with water-cooler and bottle service after a successful experiment on two cars early in the year. One of the corner seats in the front end of the main compartment in each car was removed and a pedestal was constructed to support the cooler and hide the waste pipe. This pipe has a funnel-shaped opening and is located about 5 in. below the faucet. There is also a side chute in the pedestal for receiving used paper drinking cups. A wooden band, equipped with hinge and hasp, and attached to the partition, clamps the bottle a few inches below the top.

News of Electric Railways

Traffic and Transportation

Financial and Corporate | Personal Mention | Construction News

Plans for Rhode Island Investigation

Special Committee Created by Legislature Outlines Subjects Which Will Be Covered by It in Inquiry Into Rhode Island Company Affairs

The special committee created by the Rhode Island Legislature to examine the Rhode Island Company, which operates the electric railways in Providence and vicinity, and grant financial relief if it finds such relief justifiable, made the first formal announcement of its plans on June 23, in a statement signed by Zenas W. Bliss, chairman. The statement follows:

"In accordance with the provisions of Chapter 1516, approved April 19, of the public laws, the special commission for the investigation of the affairs of the Rhode Island Company met and organized on May 1.

"The preliminary investigations of the special commission demonstrated the necessity of a systematic and complete analysis of the physical and financial condition of the Rhode Island Company along the following general lines:

"List of companies; capitalization; physical property; distribution of property by companies and civil divisions; distribution of property by sections and fare zones; estimated cost of reproduction new and present value of all properties of the several companies; cost of operation for last five years; proportion of service to traffic; increases in cost; normal and present abnormal prices of materials, labor, coal, etc.; detailed analysis of operating expenses; taxes and other expenses in nature of taxes; comparison with other cities; analysis of depreciation and renewals; return on capital; average rate of return; analysis of leases; possible economies; estimate of cost of service for present year; traffic survey; average haul in comparison with other cities; proportions of short and long haul; movement of transfer passengers; suitability of service to traffic; allocation of cost of service to several routes.

"Experts employed by and under the direction of the commission are to begin the work along the lines as generally outlined above at once.

"The questions involved appear to the commission to be of such vital importance to the public that information in regard to the matters involved should be made available as promptly as possible. The commission will, therefore, furnish for publication the results of its investigations as soon as material is obtained in sufficient quantity and can be arranged in intelligible form. In addition to furnishing this information as promptly as possible, ample provision will be made for public hearings upon matters within the scope of the authority of the commission."

Strike in Steubenville

Trainmen on the Steubenville, Wellsburg & Weirton Railway, which connects Steubenville, Ohio, with Follansbee and other towns in West Virginia, declared a strike on June 25 to enforce their demands for an increase in wages to 40 cents an hour. The company had offered the men 34 cents an hour. Apparently both sides have settled down for a period of waiting. Up to June 26 the company had made no endeavor to move its cars.

The business men of Steubenville and vicinity, through the Steubenville Chamber of Commerce, have asked the strikers to have their representatives meet with them in an endeavor to ascertain what they really want and what they will accept in settlement of their differences with the company. Mill men and others, who have depended entirely on this road for transportation, are experiencing great difficulty in getting to and from their work.

Southern Pacific Fuel Problems

Fuel Oil Shortage Severe—Electrification Suggested to Relieve Congestion on the Tehachapi Pass

At a hearing before the Railroad Commission of California early in the week ended June 30 W. R. Scott, general manager of the Southern Pacific Railroad, stated the fuel oil shortage was such that unless there was speedy relief train service must be curtailed. Considering all oil storage and sources of relief now apparent, ninety days was the maximum period for which operation on the present basis was possible. At present the company consumed 44,000 barrels of oil a week. Of this amount 18,000 barrels were being purchased in the open market. The converting of divisions to coal consumption had been considered, but the idea was abandoned as unwarranted when the visible supply of coal was taken into account.

Another very serious problem was the freight congestion over the mountain divisions, particularly the Tehachapi Pass where a single-track line must accommodate two transcontinental systems. The congestion was due partially to increased business and partially to absence of bottoms for transcontinental shipments via the canal route. Under these conditions speedy electrification had been suggested. The cost of electrification was believed to be less than double-tracking, which could be postponed by the increased capacity due to electrification. If the railroad could adapt its requirements so as to use standard electrical equipment it was believed that as an emergency measure manufacturers could supply the locomotives and at least the most critical mountain pass could be operated as an electrified division within ten months. If this was found feasible it would at the same time relieve the freight congestion and release the oil now inefficiently used in steam locomotives for purposes where hydroelectric energy is not suitable.

Toledo Mayor Seeks Valuation

Appropriation of $25,000 Asked to Value the Property of the Toledo Railways & Light Company

In presenting his expense budget to the City Council recently Mayor Milroy of Toledo, Ohio, asked for an appropriation of $25,000 to be used in making a valuation of the street railway property of the Toledo Railways & Light Company. He said that the street railway problem would never be solved until the fair value of the property was known. This must be ascertained in case the city decided to buy the property, and was necessary to fix a just and reasonable fare. In continuing, the Mayor said:

"It has long been settled by the courts that a public service corporation may charge only such rates as will permit a reasonable profit, say 6 per cent, the legal rate of interest on the money actually invested. According to the company's own report it made a profit of $510,000 on its street railway last year after paying all expenses and taxes. This amount is 6 per cent on $8,500,000. Will anybody assert that the street railway is worth that much? Yet, here we are paying a rate of fare that would be just only if there was an actual investment of $8,500,000. The company pockets the amount and suggests that it may be compelled to raise the fare again."

The Mayor went on with the statement that the company was able to make such a profit because the true value of the property was not known to the public, and that only by employing its own engineers and experts would the city be able to arrive at such a valuation.

New Wage Scales in Chicago

Surface Lines and Elevated Railways Make New Wage Agreements—Scale Increased Three Cents an Hour—New Contract Period Is Three Years

The Chicago Surface Lines and the Chicago Elevated Railways, through their presidents and after conferences with officials of the Amalgamated Association of Street & Electric Railway Employees, have agreed upon three-year working contracts for the men with a horizontal increase of 3 cents an hour. The agreement between the Surface Lines and the men includes the renewal of all the conditions of the 1915 contract, except the wage scale.

Details of the New Surface Railway Wage Scale

The old and the new scales for the surface railway men follow:

	Old Wage Per Hour	New Wage Per Hour
First three months	27 cents	30 cents
Second three months	29 cents	32 cents
Second six months	30 cents	33 cents
Second year	32 cents	35 cents
Third year	33 cents	36 cents
Fourth year	34 cents	37 cents
After fourth year	36 cents	39 cents

An increase from $3 to $3.25 is provided for night car runs. Car repairers, car placers and cleaners; and other shop and operating employees, members of the union, also receive increases on the 3-cent basis whether paid by the day, week or month. According to Leonard A. Busby, president of the Chicago Surface Lines, the new agreement carries with it a wage increase of about $1,500,000 a year. Mr. Busby has stated that this increase is not warranted by the financial condition of the company, and in fact no increase is warranted at the present time, but on the other hand the management felt that it was its duty to meet the issue of increased cost of living and to go as far as reasonably possible in helping the men. He said the only way in which the company would be able to carry this heavy burden would be through the loyal co-operation of its employees.

On June 26 the union members ratified the Surface Lines contract by a vote of about three to one in favor of the agreement. Some of the younger members of the organization created considerable opposition on the plea that the union would be bound for three years. All previous contracts have been for two years.

Rates of Wages on Chicago Elevated Railways

The men on the Chicago Elevated Railways voted on their contract on June 27. The wage scales, new and old, for the elevated railway employees follow:

	New Rate Per Hour	Old Rate Per Hour
Regular motormen	41 cents	38 cents
Extra motormen:		
First year	35 cents	32 cents
Second year	36 cents	33 cents
Third year	37 cents	34 cents
Fourth year	39 cents	36 cents
Conductors	34 cents	31 cents
Regular guards	31 cents	28 cents
Extra guards:		
First year	28 cents	25 cents
Second year	29 cents	26 cents
Third year	30 cents	27 cents
Fourth year and over	31 cents	28 cents
Switchmen:		
First year	35 cents	32 cents
Second year	37 cents	34 cents
Third year	38 cents	35 cents
Fourth year	40 cents	37 cents
Fifth year and over	41 cents	38 cents

Flagmen:	New Rate Per Month	Old Rate Per Month
First year	$53.30	$42.50
Second year	56.80	46.00
Third year and over	62.80	52.00

Women ticket agents:	New Rate Per Day	Old Rate Per Day
Regular	$2.35	$2.05
Extra, first year	1.95	1.65
Extra, second year	2.05	1.75
Extra after second year	2.15	1.85

W. D. Mahon, president of the Amalgamated Association, urged the men to accept the agreements. He said that they provided for the largest single increase in wages members of the association had ever received. The men might not profit near so well under arbitration, he pointed out.

Work on St. Louis Compromise

Program Laid Down for Conferences Looking Forward to Settlement of Matters at Issue Between City and United Railways

At a conference in the office of Mayor Kiel of St. Louis, Mo., on June 20, City Counselor Daues and Thomas M. Pierce, special counsel for the United Railways, were instructed by the joint committee to prepare a skeleton plan of compromise with the city within two weeks as a basis for negotiation by the committee. Mayor Kiel presented an outline of the city's program, which is: Full payment of the mill tax to date, $2,135,466; a partnership with the city, in which profits would be divided, scaling down of the United Railways capitalization and recognition of franchise rights for a substantial period in the future.

President McCulloch's Suggestions

Richard McCulloch, president of the United Railways, said that the company was willing to enter into a partnership or any other arrangement suggested, provided the city would make it possible to induce investors to advance money needed for improvements. Mr. McCulloch urged speedy action by the conferees, but Mr. Daues said it would not be possible to submit a report within a week, and the time was extended to two weeks. The city officials were also assured that the company was prepared to let the city in as a "full partner" in the traction business, provided a compromise of franchise and mill tax litigation could be arranged that would enable the company to borrow the money required for extensions and improvements in the next few years.

The committee representing the city is Mayor Kiel, Comptroller Nolte and Aldermen Tamme, Bergt and Schrantz. The committee representing the company is Mr. McCulloch, Murray Carleton, A. L. Shapleigh, A. J. Siegel and Thomas M. Pierce, counsel for the company.

It was reported unofficially that City Counselor Daues and C. E. Smith, consulting engineer of the Department of Public Utilities, had been quick to agree upon the general outlines of the city's counter proposal. These were stated in brief as follows:

City's Counter Proposal

"Valuation of the company's properties and contraction of its present capitalization, with a limitation of earnings to 6 per cent after deductions for depreciation, operating expenses and other charges.

"Provision for sharing the net surplus in the ratio of 60 per cent for the city and 40 per cent for the company.

"Creation of a sinking fund (as one of the fixed charges) for a gradual reduction of the capitalization below the amount to be fixed in the first agreement, so as to afford the city the right and opportunity to purchase the property at a decreasing cost.

"Reservation of the city's option of using its share of the net surplus either for public purposes or for reinvestment in improvements or extensions of the company's present system, or in the building of either subways or elevated lines or both.

"Participation by the city in the management of the company by the election of several—probably four—municipal officials as directors of the company and the appointment of another to act with the president of the corporation and supervise expenditures, including those for wages, salaries and purchases of supplies, and for improvements, betterments and extensions."

This much having been accomplished it was then stated that a meeting of the joint conference representing the company and the city would be called by Mayor Kiel for Tuesday, June 26, if by that time Counselor Daues and Engineer Smith had completed their tentative draft of the city's proposals. The Mayor desired to have the plan submitted to officials of the United Railways before he left for New York on June 27, to be absent for five or six days.

Representatives of the city and officers of the company conferred again on June 26 and after various sections of the so-called "skeleton plan" had been discussed the matter was put over until July 6. This conference resulted in making public the full "skeleton plan."

British Columbia Strike Settled

Settlement Results from an Agreement Between the City and the Company to Arbitrate Problems Before Them

The strike of the employees of the British Columbia Electric Railway, Vancouver, B. C., ended on June 22. The men were granted all demands, including the increase of 5 cents an hour. The settlement resulted from an agreement between the company and the municipal authorities to arbitrate jointly the problems before them under a commission appointed by the provincial government. Both sides are to abide by the findings of this commission. A feature of the agreement was that the company had to resume service at once and continue it. When the employees refused to compromise on the matter of wages the company agreed to their demands. It has not been settled whether the increase in wages is to be permanent or only for the duration of the war. The new wage scale is 27 cents for the first six months; 35 cents for the next eighteen months; 36 cents after two years; 38 cents after three years and 40 cents after four years. The former scale was 27 cents for the first year; 29 cents for second year; 31 cents for the third year; 33 cents for the fourth year and 35 cents for the fifth year. The interurban employees get the same rate of increase.

REVIEW OF STRIKE

The strike on the British Columbia Electric Railway in Vancouver and New Westminster was declared on June 13, after a demand for higher wages had been refused by the company. About 800 men went out. They were joined on June 14 by 300 employees of the same company at Victoria. The men who ceased work included motormen and conductors, car repairers, machinists, blacksmith's helpers, and others who were members of the Amalgamated Association. As a result the street car lines in Vancouver and suburbs, North Vancouver, New Westminster and Victoria ceased operation and the interurban lines owned by the same company, known as the Central Park line and Burnaby Lake line, between Vancouver and New Westminster, and the Saanich line at Victoria, also suspended operations.

WHAT THE MEN DEMANDED

The men were under an agreement dated Sept. 15, 1916, whch was to run until June 30, 1918, or at the expiration and six months after the cessation of the war, whichever date came first. The wage scale for city and suburban motormen and conductors, car repairers, armature winders' helpers, blacksmiths' helpers, machinists' helpers and sawyers, as noted previously, was: First year, 27 cents; second year, 29 cents; third year, 31 cents; fourth year, 33 cents; after fourth year, 35 cents. The motormen and conductors on the interurban lines were to receive 1½ cents an hour in addition to these rates. Owing to the increase in the cost of living, the men demanded increases to the following scale: Motormen and conductors on city lines, car repairers, etc., first six months, 27 cents; next eighteen months, 35 cents; third year, 36 cents; fourth year, 38 cents; fifth year, 40 cents. On the interurban lines the same increase of 1½ cents an hour above these rates was demanded. For track men 27 cents an hour was demanded for the first six months, and after that 35 cents an hour. The men, in all departments, requested a minimum wage of 35 cents an hour after six months' service. All men on a monthly salary were to receive an increase of $10 a month.

COMPANY'S COUNTER OFFER

The company's counter offer was of a series of war bonuses. Under its offer men paid up to $60 a month were to receive 15 per cent additional; men paid more than $60, but not more than $70 a month, 10 per cent; more than $70 and not more than $80, 5 per cent. The men voted to strike when the company refused to meet their demands and as a consequence no cars were operated in Vancouver, North Vancouver, New Westminster and on the Central Park and Burnaby Lake lines on June 13.

The company contended that the offer it made of war bonuses was adequate to meet the increase in the cost of living according to figures in the *Labor Gazette*, the dominion government's official publication. Although the cost of living was 18 per cent higher in Winnipeg than in Vancouver, the rate of wages offered the men was said to be higher in Vancouver. The company also pointed out that the men had received increases amounting to $120,000 a year in the fall of 1916 in spite of the existence of an unexpired agreement. The company contended that the proposed war bonuses were sufficient to meet any increase that had taken place since then.

The men said that the increases granted by the company last fall were only sufficient to bring wages to the level of what they should have been before the war and that since then an increase in the cost of living has occurred which warranted the payment of the further increases demanded.

COMPANY'S GRIEVANCE AGAINST CITY

A parallel contention by the company was that owing to jitney competition and the fixed nature of its fare, it was unable to operate under present conditions and grant the wage increases demanded by the men. On the Vancouver city system the fare is 4 1/6 cents with transfer privileges, while in North Vancouver and New Westminster, which are separate systems, there is a straight 5-cent fare.

Since December, 1914, the company's revenue has been seriously depleted by jitney competition, which has been more or less unregulated by the city. Jitney by-laws have been passed by the city of Vancouver, but the enforcement of them has been lax and when the strike occurred about 150 jitneys were operating in competition with the paying city lines, the non-paying business to the suburbs being left entirely to the street railway. In addition to the decrease in revenue caused by the jitney the company suffered through the increase in the cost of operation. It had also been affected by the increase in taxation both under the provincial government and under the local governments of the districts and cities in which it operates. The company has $48,000,000 invested in British Columbia and the increase in taxation to provincial and local governments was expected to be $50,000 this year.

INTERURBAN SERVICE STOPPED

Passenger service on the Lulu Island interurban lines of the company was stopped on June 17 when, in accordance with the request of the Electrical Workers' Union, the company was compelled to cease the employment of the three foremen on the maintenance of its rolling stock used on these lines. The electrical workers contended that this was a breach of the arrangement under which they promised not to take part in the strike and rather than jeopardize the light and power service on the mainland, the company decided to cease the employment of these foremen on maintenance work. In the interest of safety the operation of all cars on these lines was suspended. On June 18 the Fraser Valley division was being operated, but with only one car to a train instead of three.

The company set its case frankly before the public in paid daily newspaper advertisements.

Frontier Case Closed

Testimony on the application of the New York Central Railroad and the Erie Railroad for the revocation of the certificate of the Frontier Electric Railway was concluded before the Public Service Commission at Albany. Chairman Van Santvoord stated before the hearing closed that only in its last stages had the commission been frankly informed of the plans of the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railroad with regard to the Frontier line. It was brought out at the hearing on June 18 that the contract for the purchase of the road's stock by the two trunk lines was to some extent contingent upon the approval of the commission for the construction of the proposed line at grade.

The testimony was concluded by statements from railroad operating officials aimed to show that even should the line be built it would grant no great relief to the Pennsylvania and the Delaware, Lackawanna & Western from the congested conditions of connections with Canada at Black Rock from which they say they now suffer.

The companies have two weeks in which to file and answer briefs.

Meaning of Loss of Chicago Bills

Legislature Failed to Sense Popular Demand for Measures Based on Report of Chicago Traction and Subway Commission

The four Chicago traction bills have failed of passage in the Legislature. As stated in the ELECTRIC RAILWAY JOURNAL for June 23, these bills were intended to supply the enabling legislation for Chicago's extensive traction plan. The measures had passed the Senate with generous majorities and were reported to the House committee on public utilities and went to the third reading. The committee then adjourned without a record vote on any of the bills.

The bills before the Legislature grew out of the presentation of the report of the Chicago Traction & Subway Commission early in December, 1916. While considerable delay was brought about in the consideration of these bills by the Council, they were finally drafted and embodied the principal legislation needed to put through the program of the commission. The so-called "home-rule" bill was modeled after the State utilities act and would have transferred to the City Council the control over service and rates now held by the utilities commission. An editorial on the loss of the home rule bill appears elsewhere in this issue.

There was also a bill providing for the merger of the elevated and surface lines in Chicago. The Traction & Subway Commission report recommended the adoption of an indeterminate franchise, but this was attacked principally on the ground that it was virtually a perpetual franchise. The commissioners and the railway officials thought the fifty-year franchise was necessary in order to carry out the construction program. Finally, on May 9, a straight thirty-year franchise bill was approved by the Council and sent to the State Legislature. The fourth bill was designed to remove the doubt expressed by counsel as to the right of the city to construct and own subways. This measure was also approved by the City Council on May 9.

WHAT THE LOSS OF THE BILLS MEANS

All the bills recommended to the Legislature in connection with the traction program contemplated that no ordinance in connection with them should go into effect until after a referendum vote at some regular or special election. The complete loss of the legislative program for Chicago in the Legislature provoked a great deal of discussion. An expression of opinion on the loss of the bills by a man interested in the measures follows:

"The death of the four bills is most disappointing to the people of Chicago, the Chicago local transportation committee and to part of the traction interests at least. Just what the attitude of the other traction interests was is not definitely known, except that such evidence as was manifest indicated opposition. The Assembly seemed less concerned with the Chicago bills than with any other matters before it and did not quite grasp the idea of the city instead of the traction companies asking for something. It was disinclined to study the bills which Walter L. Fisher and Henry D. Capitain presented purely on their merit, and preferred instead to assume that something was being put over and to refrain from giving any thought or attention to them.

"Practically no discussion of the bills themselves was heard. Those of the opposition who talked simply orated on the awful ordinances that were going to be passed in Chicago on the strength of these bills. Other influence against the bills was plainly in evidence, but its nature could not be deciphered by the Chicago representatives. The Senate had previously considered the bills carefully, and was satisfied that there was little substance in the arguments which the opponents of the measures summoned to their aid. It passed the bills by decisive majorities.

"The issue is now dead, at least as far as any comprehensive plan is concerned, for two years, when the Legislature meets in its next regular session. The companies might still come to some temporary operating agreement looking toward an improvement in conditions, but this is quite improbable, and not much could be gained. The complete plan of the Chicago Traction & Subway Commission was needed, and the failure of the State Assembly to put through the program may be placed to its discredit as an instance of gross evasion of a popular need."

Bonus Payment at Athens

Unusual Conditions Prompt Athens Railway & Electric Company to Start Bonus System—Problems Before the Company Reviewed

On June 2 the Athens Railway & Electric Company, Athens, Ga., handed to each of its employees a bonus check, the first of a series which will supplement the last pay check each month until further notice. The bonus check amounts to about 10 per cent of the monthly payroll. To each employee was also handed at the time of the payment of the wages on June 2 a letter from C. D. Flanigen, president and general manager of the company, setting forth the reasons for the payment and reviewing the conditions that confront the company. Among the exacting requirements which it is called upon to meet are paving charges, demands for free service, accidents not due to carelessness on the part of the company and other obligations that are based largely upon public opinion rather than justice. All these pile up the cost to the company. More recently there has come along the unprecedented increase in the cost to the company of practically all material consumed by it in its regular operations. Mr. Flanigen concluded his letter as follows:

LETTER FROM THE PRESIDENT TO HIS EMPLOYEES

"Unable to ask the public more than 5 cents for a ride, or more than the old scale for electric light and power until they realize in the light of the present-day conditions the inequity of some of the burdens upon us, it has seemed out of the question to increase our payroll, but we realize that for you the situation has become so acute that some relief is necessary and we have determined in the uncertainties of the present and the absolute blank as to the future to issue to each man at the end of each month, for the present at least, a bonus check to supplement his regular pay, and so help him to meet the increased demands made upon him.

"Your bonus, if you have made a full month, will be $........ with a proportionate amount for part time, and we trust this addition to your pay check will enable you to meet all your obligations, and that we may be able to continue it so long as it is needed.

"As manager of the company and your fellow co-worker, I wish to avail myself of this opportunity to express to you my appreciation of your co-operation in enabling us to sell a first-class brand of service. Service is our merchandise and we should not be satisfied with anything less than the best for our customers. We have been pulling together and the New York office appreciates the results we have got in face of the adverse and unusual conditions that have hampered us. Our success in inaugurating economies undreamed of before without detriment to the service shows that nothing is impossible where there is efficient team work and earnest co-operation, and for this I wish to thank you."

EMPLOYEES EXPRESS THEIR APPRECIATION

On June 4 Mr. Flanigen received the following letter of appreciation from a committee of the employees:

"We, the undersigned, employees of the Athens Railway & Electric Company, take this method of thanking you for the raise, or 'bonus' attached to our salary check of June 1. We assure you that it was appreciated by all. In return we wish to pledge our efforts and co-operation in maintaining the good record made by this organization. We also wish to pledge to the company, and the public it serves, the very best service our ability affords. We thank you."

Springfield Strike Settled

The strike of the employees of the Springfield (Mo.) Traction Company has been terminated by mutual agreement on an open shop basis, the men have returned to work and good feeling and harmony prevail. An agreement has been entered into whereby in case of dispute and failure to agree between the company and the employees, the matter is to be referred to a board of arbitration. This board is to be composed of one member representing the company, one representing the employees and a third member selected from the Public Service Commission of Missouri. The strike has been in progress since October, 1916.

Massachusetts Special Commission

Members of the Body That Will Inquire Into Massachusetts Street Railways Named

W. Cameron Forbes, former Governor General of the Philippines, and former State Senator Gurdon W. Gordon of Springfield, have been appointed by Governor McCall of Massachusetts to be members of the special commission to study the problems of the street railways of the State. The other members of the commission were appointed from the Senate and the House of Representatives by Speaker Cox and President Wells. They are Senators Martin, North Attleboro; Eldridge, Somerville, and Harrop, Worcester, and Representatives Gibbs, Waltham; Worrall, Attleboro; Bunting, Methuen; Hays, Boston; Donovan, Boston, and Fitzgerald, Northampton. Senator Gordon was a former chairman of the legislative committee on street railways.

Violence in Dayton Strike

Although conductors and motormen of the Dayton (Ohio) Street Railway stated that there would be no violence during the strike, disorder has resulted. The company has kept its cars moving fairly well with men of the city employed by the company when its own men stopped work.

On June 25 three cars were attacked by a crowd and all the windows which had not been lowered because of the warm weather were broken. None of the passengers riding on the cars was injured.

A squad of police called to the scene undertook to guard one of the cars until it was run out of the vicinity, but the mob forced itself between the car and the automobile containing the officers and while in sight of them stoned the car and finished the windows that had not already been broken. No arrests were made on this occasion, as the officers were unable to identify those who actually participated.

Cleveland Subway Discussed

Underground Line from Superior-Detroit Bridge to Public Square Advocated as Start of a General Subway System

The City Council of Cleveland, Ohio, met as a committee of the whole on June 21 to consider public improvements. One of the matters taken up was the proposition of Mayor Harry L. Davis to build a subway under Superior Avenue between the new Superior-Detroit bridge and the Public Square, with terminals for all lines under the Square. Apparently the idea of a subway was favored by all, but there was a division as to the manner in which it should be done. Mayor Davis believes that it should be put into the hands of a special commission, and Director of Finance Neal said that this plan would make it possible to finance the construction by an issue of bonds outside of the ordinary statutory limitations.

The operation of the subway was also discussed. J. J. Stanley, president of the Cleveland Railway, had informed members of the Council that if a rental plan was arranged the rate of fare would have to be higher. Others thought that the saving and convenience to the company would offset the rental expense. Mr. Neal said the annual charge on a bond issue for this purpose would be $203,000, and he felt that much of this could be provided by rental.

Mayor Davis has since taken the stand that a subway and an underground terminal would be of as much benefit to automobilists, pedestrians and people using teams as to the railroad and its patrons. He therefore argued that the cost should be taken care of from a general tax, so that all may contribute to it. He said that it would be manifestly unfair for the patrons of the railway to bear the whole burden, as would be the case under a rental plan.

It is the idea of Mayor Davis that this short section of subway, with the underground terminal, would merely be the first unit of a subway system which would eventually reach all other lines and result in removing street cars from the surface in the congested section of the city. The city planning commission has recommended that the proposed subway be built, but made no suggestion as to how it should be financed or operated.

Strike Threat in Seattle

Recently Formed Union Presents Demands for Wage Increase and Shorter Day

The Seattle division of the Puget Sound Traction, Light & Power Company was threatened on June 26 with a strike of the men on the railway lines. The trainmen have organized a union affiliated with the Amalgamated Association and are aided by the Rainier Valley Railway organization of Seattle. They have demanded a large wage increase and an eight-hour day. The company has refused these demands, but has consented to the trainmen's request for arbitration. A board of three has accordingly been appointed for arbitration and conferences will be held shortly. The traction company expects no action by the men prior to the arbitration meetings.

The strike is threatened in the face of the fact that the company two days previous to the presentation of the demands by the men announced that on July 1 the Seattle men would receive a raise in wages of 2 cents an hour. A bulletin noting the increase was posted on June 21 by A. L. Kempster, manager of the company. The company also announced that the period of employment required to reach the maximum wage for that class of employment had been reduced to six years. Approximately 1500 men were to benefit by the order.

Up to three years ago the company's rules required employment for a period of fifteen years before trainmen could reach the wage maximum. Not long ago this was reduced to ten years, and on June 21 it was reduced to six years. This is the third increase in wages since the first of the year. The first was made on Jan. 1, another announced originally for July 1 was made effective on May 1, and the third was proposed for July 1. The first two raises were 1 cent an hour each, and the third 2 cents an hour. These increases add a little more than $140,000 to the annual payroll of the company.

Third East St. Louis Arbitrator Chosen.—Frank J. Keating, former city treasurer of East St. Louis, Ill., has been agreed upon as the third member of the arbitration board to decide the matter of wages to be paid employees of the East St. Louis & Suburban Railway. Al. Towers, Belleville, represents the employees, and Charles E. Smith, St. Louis, represents the company. The third arbitrator was selected after it became apparent that there was very little likelihood of Messrs. Towers and Smith being able to reach an agreement.

Fight in Council Over Extension.—The Council of Detroit, Mich., has rejected a report by the public utilities committee directing the corporation counsel to take legal action against the Detroit United Railway if it did not immediately begin work to complete the Grand Belt line. The vote of rejection was twenty-one to twelve. It was followed by the resignation from the committee of Alderman Vernor, chairman of the committee, who contended that the company was obligated to build the line. On the other hand, Alderman Littlefield said that in the four years since the contract was entered into conditions had changed greatly and that the route of the line should be abandoned and an alternate one chosen.

River Tunnel Headings Holed Through.—Oscar S. Straus, chairman of the Public Service Commission for the First District of New York, on June 21 "fired the blast" which connected the south headings of the new Whitehall-Montague Street tunnel underneath the East River. The headings "holed through" on the occasion in question, were the last of the two new downtown rapid transit tunnels being constructed under the dual system of rapid transit contracts. Two other subway tunnels, however, are being constructed further up the East River, one at Fourteenth Street and one at Sixtieth Street. The Whitehall-Montague Street tunnel will form the under-river connection between the Broadway subway in Manhattan and the Fourth Avenue subway in Brooklyn.

Kentucky Assessments Increased.—Assessments of practically all the Kentucky utility corporations have been increased by the Kentucky Board of Valuation and Assessment. The new tax law will go into effect this fall and the assessments are announced for this year. They are subject to revision after representatives of the companies are heard. Among the assessments announced are the following: Louisville & Southern Indiana Traction Company, $82,783, increased from $57,330; Louisville & Northern Railway & Lighting Company, $53,156; Louisville & Interurban Railway, $2,142,956, increased from $2,115,000; Kentucky Traction & Terminal Company, $1,500,000 increased from $1-200,000; Ohio Valley Electric Railway, Huntington, W. Va., $722,913, increased from $496,681.

Protest Against Paving Unavailing.—In face of a vigorous protest from F. I. Fuller, vice-president of the Portland Railway, Light & Power Company, the City Council of Portland, Ore., recently passed an ordinance providing for the improvement of the East Fiftieth Street from Division Street to Powell Valley Road by paving. In his statement to the Council Mr. Fuller said that his company did not have any franchise from the city for its railway tracks on the street, that it would be unable to bond the cost of its share of the improvement against its franchise, and would have to pay cash. The company was not financially able to meet the expense at this time. He also admitted that employees of the company, because the company had granted them a recent increase in wages, had volunteered to circulate a remonstrance against the improvement in order to save the expense. He asked the Council to take no action until it had investigated the proposal fully. The company's share of the cost of the proposed work will be approximately $41,000. The ordinance was passed by the Council, however, without a dissenting vote.

New York Central Improvement Committee Organized.—Henry W. Hodge of the Public Service Commission for the First District of New York has been elected chairman of the joint conference committee of the Board of Estimate & Apportionment and the Public Service Commission for the First District, named under the Ottinger-Ellenbogen act passed by the last Legislature for the purpose of finding a solution of the New York Central Railroad west side track problems. The other members of the joint conference committee are Public Service Commissioner Charles S. Hervey, Borough Presidents Maurice E. Connolly of Queens; Marcus M. Marks of Manhattan; and Calvin D. Van Name of Richmond. The last three represent the Board of Estimate & Apportionment. The committee has already had one conference with Ira A. Place, vice-president of the New York Central Railroad. Other meetings of the joint conference committee will be held in the near future. One of the questions before the joint conference committee is the removal of the tracks of the railroad from the surface on the west side of the city and their electrification.

Kentucky Passes Void.—Passes issued by common carriers as part of the consideration of a contract prior to the enactment of the Kentucky anti-pass law are void, according to a decision of the Kentucky Court of Appeals handed down on June 22. There were two cases before the court, each seeking mandatory injunction to compel the Kentucky Traction & Terminal Company, Lexington, to continue issuing transportation to plaintiffs and their families. James A. Murray gave a right-of-way through his property to the Capital Railway, predecessor of the Kentucky Traction & Terminal Company, and part of the consideration was perpetual passes for himself and family. The contract was entered into after the adoption of the present State Constitution, which contains a provision prohibiting unfair discrimination in transportation rates and directs the Legislature to enact laws to carry the provision into effect. When the new law became effective the railway canceled the passes, along with numerous others. Murray and others filed suit contending that their passes were given for valuable consideration and that the law, if it affected them, impaired the obligation of a contract and was in contravention of the Constitution. The Court of Appeals, however, said that the contract was entered into in full knowledge of the fact that the Constitution gave the State police powers to prohibit granting of passes, and the anti-pass law prohibited them except in exchange for advertising. The court added: "Whether appellees have a remedy for loss that may result to them from the abrogation of their contracts with the appellant is not now decided."

Financial and Corporate

Annual Reports

United Light & Railways Company

The income statement of the United Light & Railways Company, Grand Rapids, Mich., for the year ended Dec. 31, 1916, follows:

SUBSIDIARY COMPANIES		
*Gross earnings (including $914,644 for inter-company business)		$6,885,779
*Operating expenses and taxes (including $914,644 for inter-company charges)		4,219,386
Net earnings		$2,666,393
Interest and dividends on subsidiary bonds, preferred stocks and notes:		
To United Light & Railways Company	$477,642	
To the public	912,871	1,390,513
Net earnings on stocks—subsidiary companies		$1,275,880
Net earnings due others than United Light & Railways Company		18,389
UNITED LIGHT & RAILWAYS COMPANY		
Earnings available on stocks owned		$1,257,490
Dividends and interest receivable		489,428
Miscellaneous earnings		171,903
Gross earnings		$1,918,821
Expenses	$125,446	
Taxes, general and federal	21,462	146,908
Net earnings		$1,771,913
Interest on first and refunding 5 per cent bonds		403,724
Balance		$1,368,189
Interest on ten year 6 per cent convertible gold debentures	$7,262	
Interest on three and five year notes	135,000	
Interest on commercial loans	32,654	174,916
Balance available for dividends		$1,193,273
Dividends on first preferred stock—6 per cent		595,792
Surplus earnings		$597,480

*This amount of $914,644 represents inter-company transactions, of which $288,185 is for electric power sold to subsidiary railway companies.

From the surplus, $298,353 was credited to the depreciation reserve (of which the United Light & Railways Company's proportion pro rated on its stock holdings of subsidiary companies is $292,859). In addition the subsidiary companies expended or set aside for maintenance an additional sum of $432,112, which was charged directly to operating expenses—making the total expended or set aside for maintenance and depreciation of property $730,466, or more than 12.75 per cent of the gross earnings received from the sale of gas, electricity, heat and transportation.

The operating expenses of subsidiary companies included $295,431 accrued for payment of general and federal taxes, an increase of $34,057 for the fiscal year, and also substantial increases in wages paid to all classes of employees.

The gross business of the company in all departments showed a substantial increase, but owing to the increased cost of materials and wages involved in operation, increased general and federal taxes, and to material reductions made in gas and electric rates, the net earnings, while satisfactory, did not show such a large proportionate increase. The revenue passengers of all classes carried on the railways were 38,013,075, an increase of 4,484,082 or 13.37 per cent. Below is a comparative statement indicating the sources of revenue both gross and net, and the percentage each class of service bore to the total:

Gross Earnings:	1916	Per Cent of Total	1915	Per Cent of Total
Gas	$1,353,805	19.66	$1,318,922	20.91
Residuals	92,709	1.35	122,934	1.95
Electric	2,587,459	37.58	2,322,983	36.82
Railway—City lines	1,806,218	26.23	1,599,459	25.35
Railway—Interurban	868,601	12.61	791,361	12.55
Heat	86,215	1.25	81,004	1.28
Miscellaneous	90,770	1.32	72,109	1.14
Total	$6,885,779	100.00	$6,308,776	100.00
Net earnings:				
Gas	$564,160	21.16	$611,353	24.64
Electric	1,152,546	43.22	1,101,701	44.40
Railway—City lines	571,968	21.45	439,867	17.73
Railway—Interurban	300,693	11.28	254,143	10.24
Heat	10,745	.40	19,732	.79
Miscellaneous	66,280	2.49	54,714	2.20
Total	$2,666,393	100.00	$2,481,514	100.00

During 1916 $1,474,274 was expended for additions to properties and extensions of service. Of this total $271,078 was for gas properties, $537,474 for electric properties, $619,333 for railway properties and $46,387 for heating properties. Expenditures made for construction were largely in the nature of natural extensions of gas, electric and railway service, due to the growth of the communities served—in some cases to complete work started in the year 1915.

Omaha & Council Bluffs Street Railway

The comparative statement of income, profit and loss of the Omaha & Council Bluffs Street Railway, Omaha, Neb., for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation	$3,069,324	94.35	$2,839,180	94.76
Revenue from other operations	184,003	5.65	156,898	5.24
Gross operating revenues	$3,253,327	100.00	$2,996,079	100.00
Operating expenses	1,833,146	56.35	1,656,643	55.29
Net operating revenue	$1,420,180	43.65	$1,339,435	44.71
Taxes assigned to railway operations	288,679	8.85	....	....
Operating income	$1,131,501	34.80	....	....
Miscellaneous income	14,839	0.45	12,919	0.43
Gross income	$1,146,340	35.25	$1,352,355	....
Deductions from income*	636,204	19.56	872,010	....
Net income	$510,136	15.69	$480,344	16.04
Dividends	400,000	12.30	412,500	13.77
Surplus for year	$110,136	3.39	$67,844	2.27

*In 1916 these include only $296 for miscellaneous taxes, but in 1915 they included $240,660, no assignment to railway operations being made.

The 1916 gross operating revenues, compared with 1915, show an increase of $257,248 or 8.59 per cent. The operating expenses increased $177,003 or 10.69 per cent, so that the net operating revenue gained $80,745 or 6 per cent.

On July 1, 1916, the wage scale for trainmen was increased 1 cent per hour, making an increase in the payroll of about $30,000 for the last six months of 1916. At the same time a general increase in wages was made in the shops and all other operating departments. These increases, together with increased cost of all materials and fuel, make up a large part of the increased cost of operation. In addition to these increases the charge to operating expenses for depreciation was increased by $60,000, and $41,000 additional was set aside for injuries and damages.

Taxes for the year amounted to $288,679, an increase of $51.167. The net income for 1916 represented an increase of $29,792 or 6.2 per cent. After paying $200,000 in preferred dividends at 5 per cent and the same amount in common dividends at 4 per cent, the company charged out $15,782 for losses, and $50,000 for a miscellaneous reserve to cover purchased securities. Notwithstanding these increases in reserves and expenses, the actual net earnings for the year, added to surplus, amounted to $48,449. The balance shown in accrued depreciation as of Jan. 1, 1917, was $1,383,069. The sum of $175,179 was charged to this account during the year for rebuilding tracks and other replacements. During the year $137,318 was expended for additions and betterments.

The annual report states that the elimination of jitneys, on account of their inability to carry passengers in competition with the company, added a considerable sum to the gross earnings in 1916 as compared with last year. The growth of the cities served was the principal factor, while the good times and activity in all lines of business, together with favorable weather conditions, contributed to the final result.

Bucks County Interurban Railway, Newtown, Pa.—All of the $400,000 of outstanding first mortgage 5 per cent thirty-year bonds of the Trenton, New Hope & Lambertville Street Railway, secured by mortgage of the company to the Trenton Trust & Safe Deposit Company, dated Aug. 1, 1904, will be redeemed and paid at the rate of $1,100 for each $1,000 bond, together with accrued interest, if presented at the office of the trustee on Aug. 1, 1917. The Bucks County Interurban Railway is a consolidation of the Trenton, New Hope & Lambertville Street Railway, Yardly, Morrisville & Trenton Street Railway, Newtown & Yardly Street Railway and the Bucks County Electric Railway.

Cities Service Company, New York City.—The abolition of the present par value of $100 and the exchange of ten shares of new common stock without par value for each one of the present issue was recommended to the directors of the Cities Service Company by a special committee at a meeting of the board on June 22. Application to the New York Stock Exchange for the listing of both the preferred and the common stocks of the Cities Service Company was also favored. Both matters were referred to counsel for their report. A suggestion that debenture bonds be issued as a method of future financing of the Cities Service Company and its subsidiaries by stockholders was adversely reported, so far as action at this time is concerned. The retirement or refunding of subsidiary bonds by this method was objected to by the committee because, owing to the small proportion of such issues with early maturity, the profits in such financing would be used up in called premiums instead of benefiting the stockholders.

General Gas & Electric Company, New York, N. Y.—The holders of the cumulative preferred stock of the General Gas & Electric Company have received circulars stating that the July 1 quarterly dividend declaration has been deferred because of the increases in fuel costs. W. S. Barstow, president of the company, says in part: "Up to a short time ago, the board of directors decided that the discontinuing of the dividends on the cumulative preferred stock would not be necessary. In view, however, of the actual results during the first part of this year, the directors are now unanimous in feeling that it is clearly their duty to defer at this time the declaration of the quarterly dividend on the cumulative preferred stock due July 1. Dividends on this stock, however, are cumulative and as soon as the affairs of the company return to a more normal basis the dividends due on this stock must be made up before any dividends can be paid on any other stocks of the company. The gross revenues of the subsidiary companies are increasing steadily over the corresponding periods of last year. Furthermore, public service commissions are now generally approving increases in rates which have been clearly shown to be productive of a loss to the company. The companies have not, however, received the actual benefit of any such increases up to the present time. For the first four months of this year the increase in the gross revenues of the subsidiary companies has been $76,160 as compared with the same period of last year. The increased operating expenses and taxes, however, for the same four months, which under normal conditions should not have exceeded $46.000 were actually $134,606."

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The Ohio Public Utilities Commission on June 21 authorized the consolidation of the Youngstown & Sharon Railway, the Mahoning Valley Railway, the Youngstown Park & Falls Railway, the Mahoning Valley Southeastern Railway and the Poland Street Railway with the Mahoning & Shenango Railway & Light Company. Considerations of economy and a desire to centralize the management brought about the decision to consolidate the companies. A syndicate, composed of Lee, Higginson & Company, New York; Drexel & Company, Reilly, Brock & Company, and Graham & Company, Philadelphia, have purchased $500,000 of Mahoning & Shenango Railway & Light Company 5 per cent bonds, due November, 1920, which are being offered at 97½, to yield 5.80 per cent.

Middle West Utilities Company, Chicago, Ill.—The stockholders of the Middle West Utilities Company, at the annual meeting held in Wilmington, Del., recently, approved the proposed amendment of the company's charter and authorized the proposed increase in the preferred and common stocks to $20,000,000 each. The directors were all re-elected.

Monongahela Valley Traction Company, Fairmont, W. Va.—The Monongahela Valley Traction Company has declared an extra dividend of $1.25 a share in addition to the regular quarterly dividend of $1.25 a share on the common stock. A dividend of 83 1/3 cents a share has also been declared on the preferred stock, for two months, payable on July 5 to holders of record of June 30. The usual dividend on the common stock is payable on July 16 and the extra on Aug. 16, both to holders of record of June 30. The stockholders of the company are reported to have authorized an increase in the capital stock of the company from $12,000,000 to $16,000,000, of which $4,000,000 is 6 per cent preferred and the balance common stock. At the same time the parity of the stock has been reduced from $100 to $25.

Morris County Traction Company, Morristown, N. J.—Bondholders of the Morris County Traction Company held a meeting at Morristown recently and heard the report of a committee of nine, appointed about three months ago to inquire into the finances of the company. As a result a readjustment of the finances has been agreed upon. The company at present has outstanding $3,000,000 of first mortgage bonds, $1,179,000 of second mortgage bonds and $300,000 of stock. The second mortgage bondholders have agreed to the substitution of income bonds for their holdings. The holders of the first mortgage bonds have agreed that the coupons representing interest now unpaid on the first mortgage bonds shall be cut off and deposited with the National Iron Bank of Morristown and that for the coupons for the next five years shall be substituted new coupons calling for the payment of 1 per cent every six months, beginning next December.

Northern States Power Company, Chicago, Ill.—The Guaranty Trust Company, Harris Forbes & Company, William P. Bonbright & Company, Inc., and H. M. Byllesby & Company, Chicago, Ill., are offering for subscription at 93½ and interest yielding about 5½ per cent $3,500,000 of Northern States Power Company first and refunding mortgage 5 per cent gold bonds dated April 1, 1916, and due April 1, 1941. The amount of these bonds outstanding, including the present issue, is $21,500,000. There are also outstanding $7,556,000 of first mortgage 5 per cent bonds of the Minneapolis General Electric Company, $7,805,000 of ten-year gold notes, $13,233,300 of 7 per cent cumulative preferred stock and $6,170,000 of common stock.

Orleans-Kenner Electric Railway, New Orleans, La.—Some time ago Allen H. Johness, president of the General Realty Company, announced he had formed a local syndicate to take over the property of the Orleans-Kenner Electric Railway and that all the necessary cash had been subscribed. Johnson & Company, controlling the company, had borrowed $150,000 from Bertron, Griscom & Company, New York. Recently when it was reported that the New Orleans Railway & Light Company would secure the property through Johnson & Company Jefferson parish property holders entered a protest. Francis T. Homer of the firm of Bertron, Griscom & Company, who is also president of the American Cities Company, which controls the New Orleans Railway & Light Company, then said his firm would relinquish to the Jefferson parish people all its rights if they would arrange to take care of the indebtedness. Mr. Homer said recently he knew of nothing new in the situation except that the firm had received a letter from J. D. Purcell, who put up most of the original capital for the line, saying the deal with the Johness syndicate was off. Mr. Johness later is reported to have said the negotiations were discontinued partly on account of conditions affecting the property which have originated since an act of purchase was drawn up.

Pittsburgh & Butler Railway, Pittsburgh, Pa.—The property and franchises of the Butler Passenger Railway, which was consolidated with the Pittsburgh & Butler Street Railway in March, 1914, to form the Pittsburgh & Butler Railway, were purchased on June 12 at public sale by Attorney C. F. Hosford, Butler, acting for the bondholders' protective committee of the company. The price paid was $250,000. The public sale of the property and franchise of the company under the decree of the court was fixed for May 9, but as the bids received then were unsatisfactory the sale was postponed to June 12. The property of the Pittsburgh & Butler Street Railway, which with the Butler Passenger Railway went to make up the Pittsburgh & Butler Railway, was purchased under foreclosure on May 9 for $670,250 by R. H. Boggs, president of the Pittsburgh, Harmony, Butler & New Castle Railway, presumably in the interest of that company.

Springfield (Mass.) Street Railway.—The Springfield Street Railway has petitioned the Massachusetts Public Service Commission for approval of an issue of $3,377,000 of twenty-year 6 per cent bonds for general improvements and to pay outstanding debts.

Wisconsin Valley Electric Company, Wausau, Wis.—The First National Bank and Morris F. Fox & Company, Milwaukee, Wis., are offering at 97 and interest $925,000 of first and refunding mortgage 5 per cent bonds of the Wisconsin Valley Electric Company. The bonds are dated May 1, 1917, and are due May 1, 1942, but are callable at 102 and interest on any interest date. The proceeds from the sale of these bonds and of certain stock are to be used to reimburse the company for the purchase of the Merrill and Stevens Point properties, extending the transmission line and for additions.

Dividends Declared

Bangor Railway & Electric Company, Bangor, Me., quarterly, 1¾ per cent, preferred.

Boston & Worcester Electric Companies, Boston, Mass., $1, preferred.

Capital Traction Company, Washington, D. C., quarterly, 1¼ per cent.

Central Illinois Public Service Company, Mattoon, Ill., quarterly, 1½ per cent, preferred.

Chicago City & Connecting Railways, $1.50, preferred participating certificates.

Chicago (Ill.) City Railway Company, quarterly, 2 per cent.

Cincinnati & Hamilton Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly, 1⅛ per cent, preferred; quarterly, 1½ per cent, common.

Cincinnati (Ohio) Street Railway, quarterly, 1½ per cent.

Cities Service Company, monthly, ½ of 1 per cent, common and preferred; ½ of 1 per cent, common, payable in common stock.

Consolidated Traction Company of New Jersey, Newark, N. J., 2 per cent.

International Traction Company, Buffalo, N. Y., quarterly, 1¾ per cent, on 7 per cent cumulative first preferred; quarterly, 1 per cent, on 4 per cent cumulative preferred; 1 per cent, common.

Iowa Railway & Light Company, quarterly, 1¾ per cent, preferred.

Little Rock Railway & Electric Company, Little Rock, Ark., 3 per cent, common and preferred.

Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.

Mohawk Valley Company, New York, N. Y., quarterly, 1½ per cent.

New England Investment & Security Company, Springfield, Mass., 2 per cent, preferred.

New Orleans Railway & Light Company, New Orleans, La., quarterly, 1¼ per cent, preferred.

New York State Railways, New York, N. Y., quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

Nova Scotia Tramways & Power Company, Halifax, N. S., 3 per cent, preferred.

Philadelphia & Western Railway, Upper Darby, Pa., quarterly, 62½ cents, preferred.

Porto Rico Railways, Ponce, P. R., quarterly, 1¾ per cent, preferred.

Reading (Pa.) Traction Company, 75 cents.

Republic Railway & Light Company, Youngstown, Ohio, quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

Ridge Avenue Passenger Railway, Philadelphia, Pa., quarterly, $3.

Washington Water Power Company, Spokane, Wash., quarterly, 1 per cent.

West India Electric Company, Ltd., Kingston, Jamaica, quarterly, 1¼ per cent.

Wisconsin Edison Company, Inc., New York, N. Y., quarterly, 50 cents.

Electric Railway Monthly Earnings

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
CITIES SERVICE COMPANY, NEW YORK, N. Y.					
1 m., May, '17	$1,565,425	$28,341	$1,537,084	$234	$1,536,850
1 “ “ '16	709,085	20,113	688,972	44,121	644,851
12 “ “ '17	15,218,272	287,038	14,931,234	42,624	14,888,610
12 “ “ '16	6,012,968	201,343	5,811,625	503,454	5,308,171
CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.					
1m., Apr., '17	$233,439	*$158,628	$74,811	$66,499	$8,312
1 “ “ '16	211,944	*134,794	77,150	66,287	10,863
12 “ “ '17	2,959,916	*1,893,698	1,066,218	810,671	255,547
12 “ “ '16	2,717,239	*1,591,665	1,125,574	798,254	327,320
KANSAS CITY (MO.) RAILWAYS					
1 m., May, '17	$627,086	*$432,652	$194,434	$129,769	††$41,961
1 “ “ '16	642,691	*410,991	231,700	117,819	††53,898
12 “ “ '17	6,778,017	*4,558,355	2,220,662	1,430,640	††441,393
12 “ “ '16**					
KEY WEST (FLA.) ELECTRIC COMPANY					
1 m., Apr., '17	$10,874	*$7,291	$3,583	$2,511	$1,072
1 “ “ '16	9,759	*5,930	3,829	2,519	1,310
12 “ “ '17	122,673	*82,859	39,814	30,196	9,618
12 “ “ '16	113,292	*76,659	36,633	30,542	6,091
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.					
1 m., Apr., '17	$68,053	*$50,275	$11,778	$15,702	$2,076
1 “ “ '16	60,400	*41,224	19,176	16,120	3,056
12 “ “ '17	836,375	*596,756	239,619	185,585	54,034
12 “ “ '16	754,476	*496,289	258,187	191,663	66,524
NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.					
1 m., Apr., '17	$201,591	*$130,576	$71,015	$40,714	$30,301
1 “ “ '16	193,641	*113,361	80,280	42,815	37,465
12 “ “ '17	2,423,840	*1,511,622	912,218	501,198	411,020
12 “ “ '16	2,207,502	*1,358,923	848,579	514,503	334,076
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO					
1 m., Apr., '17	$528,240	$312,917	$215,323	$83,919	$131,404
1 “ “ '16	399,830	192,744	207,086	95,436	111,650
4 “ “ '17	2,020,328	1,217,468	802,860	329,358	473,502
4 “ “ '16	1,518,582	726,719	791,863	388,986	402,677
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.					
1 m., Apr., '17	$175,359	*$104,007	$71,352	$29,158	$42,194
1 “ “ '16	146,494	*91,984	54,510	28,724	25,786
12 “ “ '17	2,028,964	*1,200,271	828,693	348,357	480,336
12 “ “ '16	1,801,013	*1,099,351	701,662	337,140	364,522
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1 m., Apr., '17	$23,865	*$18,822	$5,043	$7,196	†$2,153
1 “ “ '16	24,384	*15,899	8,485	7,137	1,348
12 “ “ '17	311,379	*229,879	81,500	86,465	4,965
12 “ “ '16	296,777	*179,699	117,078	89,444	27,634
PENSACOLA (FLA.) ELECTRIC COMPANY					
1 m., Apr., '17	$24,057	*$15,189	$8,868	$7,813	$1,055
1 “ “ '16	23,391	*12,657	10,734	7,678	3,056
12 “ “ '17	290,118	*167,831	122,287	92,899	29,388
12 “ “ '16	271,383	*150,630	120,753	87,617	33,136
PHILADELPHIA (PA.) RAPID TRANSIT COMPANY					
1 m., May, '17	$2,570,440	$1,436,859	$1,133,581	$810,894	$322,687
1 “ “ '16	2,391,370	1,296,001	1,095,369	815,599	279,770
11 “ “ '17	26,027,835	14,599,131	11,428,704	8,953,108	2,475,596
11 “ “ '16	23,526,374	13,106,169	10,420,205	8,977,507	1,442,698
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.					
1m., May, '17	$474,433	$224,584	$249,849	$217,826	$32,023
1 “ “ '16	445,223	212,914	232,309	225,705	6,604
12 “ “ '17	5,647,205	2,538,931	3,108,274	2,696,308	411,966
12 “ “ '16	5,457,872	2,565,914	2,891,958	2,699,644	192,314
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.					
1 m., Apr., '17	$754,687	*$460,884	$293,803	$191,025	$102,778
1 “ “ '16	645,088	*422,900	222,188	184,290	37,898
12 “ “ '17	8,571,266	*5,244,570	3,326,696	2,241,688	1,085,008
12 “ “ '16	7,643,873	*4,879,073	2,764,800	2,192,916	571,884
REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO					
1 m., May, '17	$371,745	*$257,291	$114,454	$82,638	‡$37,984
1 “ “ '16	326,400	*199,694	126,706	68,446	‡61,443
12 “ “ '17	4,228,747	*2,623,123	1,605,624	895,941	‡738,895
12 “ “ '16	3,523,962	*2,079,992	1,443,970	743,054	‡713,232
SAVANNAH (GA.) ELECTRIC COMPANY					
1 m., Apr., '17	$76,968	*$51,554	$25,414	$23,908	$1,506
1 “ “ '16	64,897	*43,257	21,640	23,501	†1,861
12 “ “ '17	867,963	*574,882	293,081	285,198	7,883
12 “ “ '16	785,244	*523,311	261,933	261,934	†16,744
TAMPA (FLA.) ELECTRIC COMPANY					
1 m., Apr., '17	$82,261	*$47,183	$35,078	$4,372	$30,706
1 “ “ '16	78,959	*44,595	34,364	4,394	29,970
12 “ “ '17	983,651	*537,088	446,563	52,305	394,258
12 “ “ '16	987,491	*515,777	471,714	52,221	419,493

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*Includes taxes. †Deficit. ‡Includes non-operating income.

**During the fiscal year to February 14, 1916, the property was operated by the receivers under the old securities; and the figures for this period, being without value in a comparative statement, are not shown here.

††Includes addition of miscellaneous income and deduction of Kansas City surplus reinvested in plant.

Traffic and Transportation

Seattle Service Decision

A Review of the Issues Involved and the History of the Case Upon Which U. S. Supreme Court Passed on June 11

The Supreme Court of Washington, D. C., on June 11, in the case of the Puget Sound Traction, Light & Power Company, Seattle, appellant, against the State Public Service Commission, appellee, affirmed the judgment of the district court for the Western District of Washington. The traction company asked the district court for a temporary injunction restraining the commission, after a trial on its merits, from enforcing so much of a commission order as the company alleged violated the fourteenth amendment of the Constitution, Art. 1, Sec. 10, and the public service law of the State. The order directed:

"That the defendant furnish sufficient cars to provide seats for substantially all persons using the Alki Point and Fauntleroy Park lines."

A temporary injunction was granted as to the third section of the order, but denied as to the remainder. Appeal was from this denial, but the Supreme Court affirmed the action of the district court. The application of the company for an injunction on the first and second sections of the commission's order will now be heard on its merits in the district court.

James B. Howe, general counsel for the company, states that the decision of the Supreme Court does not finally determine the main questions at issue. Mr. Howe is quoted as follows:

"Our original complaint had to do only with the Alki and Fauntleroy Park lines, mentioned in the decision of the Supreme Court. We have filed an amended complaint, showing the situation as affecting the entire Seattle system, and we are now fully confident, in view of the decision on June 11, that our contention will be sustained by the court on the final argument."

HISTORY OF THE CASE

The Puget Sound Traction, Light & Power Company was the owner of two franchises under which were operated two street railway lines known as the Fauntleroy line and the Alki line. The franchises for these lines terminated at the intersection of Yesler Way and First Avenue. From Yesler Way north to Virginia Street the company owned another line operated under another franchise. The Public Service Commission made an order requiring the company to operate the Fauntleroy and Alki cars so that instead of passengers paying a 5-cent fare and obtaining a transfer at the intersection of Yesler Way and First Avenue, in order to entitle them to proceed further north, they must be carried in the same car from the southern terminals of the Fauntleroy and Alki lines to Virginia Street, and from Virginia Street south to the southern terminals of those lines, without change. The effect of this order enabled passengers to travel on a 4-cent ticket instead of for a 5-cent fare and obtain a transfer. The commission also made an order requiring the company to furnish every passenger with a seat except in case of emergency.

The company filed a complaint in the federal court and attacked the order of the commission, on the ground that the order constituted a violation of the contract contained in the company's franchise and deprived it of its property without due process of law. The Fauntleroy and Alki lines never paid operating expenses, and the court found that as the lines extended over tidelands, which were unsettled, the greater the amount of business done by the company the greater would be the loss to the company, owing to the long haul. The court denied the company relief upon the ground that it did not appear from the complaint that the other lines of the company did not produce a fair return on the value of all of the company's street railway system.

A temporary injunction was granted as to that part of the order requiring a seat for every passenger, and denied as to that part which required through service. An amended complaint was filed by the company, alleging that the return from the entire street railway system was inadequate, and the case is still pending on the amended bill.

An appeal from the order denying a temporary injunction was taken to the Supreme Court of the United States, but the order of the district court was affirmed. A copy of the opinion of the Supreme Court had not yet been received in Seattle when this account was prepared, but it is understood that the Chief Justice and Justices McKenna and McReynolds dissented. It is also understood from the newspaper report that the court held it incumbent upon the company to show that its street railway system did not produce a fair return, and in the absence of such showing, no relief could be had because particular lines failed to earn operating expenses.

The company contended that inasmuch as each line was constructed and operated under a separate franchise, which was sold by the city to the highest bidder, the fact that the various franchises subsequently were vested in a single owner did not change the obligations of the owner from those stated in the franchises. The company also contended that, it having been admitted that the reason the two lines were operated at a loss was not from lack of business but because the fare allowed by law was less than a reasonable rate and less than the value of the service rendered, the company was deprived of its property without due process of law, even though from other property the revenue was sufficient to yield the company a return on the value of all of its property.

The case will proceed to trial upon the amended bill and will probably be disposed of on its merits within the next six months.

Employees' Bulletin for M. V. T.

The Monongahela Valley Traction Company, Fairmont, W. Va., has issued the first number of a publication called the *M. V. T. Company Employees' Magazine.* The paper is edited by Shannon Allen and will be published on the fifteenth of each month. The first issue contains thirty-four pages of editorial matter with main departments as follows: General News, Editorials, Railway, Mining, Gas, Power and Home and Garden. Advertising is also carried. A short message in this number from General Manager E. B. Moore to the employees contains the following paragraph:

"The business of this company is very diversified, consisting of railways, electric lighting, power, natural gas and coal mining, and a little later artificial gas will be added. Due to this diversity there is practically no personal contact between the employees of some of the different departments. I hope this magazine may be the means of bringing about a closer relationship and unity of interest among all employees, including the officials, who, of course, are employees, too."

Texas Has New Traffic Law

The State of Texas has enacted a new State highway law which became effective June 20. The law provides for the licensing of motor vehicles to produce revenue which will be used in improving the State roads. Jitneys are affected inasmuch as a commercial vehicle within the terms of the act is held to be any vehicle carrying passengers or freight for hire. The act takes from the various cities the right to tax automobiles or other motor vehicles, and imposes a State license tax of 35 cents per horsepower on pleasure automobiles, with a minimum charge of $7.50 and a graduated tax ranging from $25 to $300 a year on commercial automobiles according to their gross weight. It provides that no other license tax shall be imposed by city or county. This provision, it is claimed, will prevent any city from imposing a regulatory tax, which will mean that the cities will have no supervision over jitney buses operating on their streets. This point will likely find its way into the courts for judicial determination and the cities will make a strong fight for their right to regulate jitneys.

Jitneys in Dallas are now operating practically without restriction, since the enforcement of the ordinance recently approved by the voters of Dallas, which was initiated by the members and friends of the Jitney Drivers' Association, has been enjoined by the railway companies. Several commissioners of Dallas, however, have expressed their determination to enact other regulatory measures. Commissioner Doran has come out openly for an ordinance that will restrict the jitneys to certain streets and impose on them a tax, such tax to go into a fund for the maintenance of paving. He declares that the jitneys use the paved streets and as a matter of equity should contribute liberally to their original cost and upkeep.

I. U. T. Safety-First Banquet Canceled.—The semi-annual safety-first banquet of the Union Traction Company of Indiana, Anderson, Ind., which was to have been held this month, was canceled on account of the present national conditions.

Free Transfers Asked in Duluth.—Park Point residents have petitioned the City Council of Duluth, Minn., to bring pressure to bear upon local traction companies to secure free transfer privileges between the lines of the Duluth Street Railway, which serves the city proper, and the Park Point Traction Company, which serves Minnesota Point only. The lines are separated by the Duluth ship canal and a charge of 2 cents is now made for transfers.

Women to Check Traffic.—The Beaver Valley Traction Company, New Brighton, Pa., is planning to employ women to check traffic. An advertisement in the local papers on June 23 reads as follows: "Wanted: Five women to check traffic; must be ex-school teachers, teachers on vacations or women of equal school training. Short hours. Good pay. Apply in own handwriting or in person to the Beaver Valley Traction Company, Junction Park Office, New Brighton."

Jersey Road Wants 6-Cent Fare.—The North Jersey Rapid Transit Company, Hohokus, N. J., operating between Warren Point and Suffern, N. Y., has applied to the State Board of Public Utility Commissioners for permission to increase its fare from 5 cents to 6 cents. H. H. Parmelee, receiver for the company, asked the commission to authoize an increase of fare to 6 cents in the local municipalities through which the line is operated. After the hearing the testimony was laid over for action by the board after conference.

Jitney Insurance Company Quits Newark Field.—The Manufacturers' Liability Insurance Company, Jersey City, N. J., which has been bonding some of the jitneys in Newark, has decided to abandon the Newark field and has canceled the seventy-five policies it held there. The company is a mutual concern sharing its profits with the policyholders. It is said that the reason for this action was that the prevalence of jitney accidents in Newark made the business unprofitable. It is said the policies will be taken over by the Manufacturers' Casualty Insurance Company, Philadelphia, Pa.

Pennsylvania Commission Lowers Fare.—The Public Service Commission of Pennsylvania has ordered the Eastern Pennsylvania Railways to reduce its fare to 5 cents instead of 10 cents, now charged on its line from Pottsville to the limits of the former Yorkville borough. The change is the result of years of effort of the Pottsville Retail Merchants' Association. The company had sought to justify the former fare on account of rentals paid to the People's Railway, which owns the charter rights and original roadbed. Under the agreement between the companies the more passengers carried the higher is the rental.

Springfield to Improve Jitney Regulation.—A new jitney ordinance being considered by the City Council of Springfield, Mass., would prohibit persons engaged in other occupations from operating passenger-carrying automobiles and would bond each driver to the extent of $1,000 instead of bonding the machine owners, as at present. It is hoped to eliminate objectionable features of the ordinance passed last year. Part-time operators will probably be prohibited from obtaining a license in order to decrease the number of jitneys and force incompetent drivers out of business. Other clauses relate to the display of signs, number of working hours, the operating routes and similar measures.

Temporary Franchise Amendment Proposed.—Two measures, which are intended to give the Virginia Railway & Power Company relief from the increased cost of operation and maintenance, were presented recently before the Board of Aldermen of Richmond, Va. The ordinances were drawn in the form of amendments to franchises held by the company. They would abolish school children's and workingmen's tickets, which are now sold at the rate of six for 25 cents, and would also grant the company the privilege of issuing only one transfer. A 10-per cent city tax on the company's gross receipts is specified to replace the graded tax in effect at present. The ordinances are said to be virtually war measures since the operative period has been set at only five years.

Newspaper Publicity for Kansas City Railways.—An interesting development of the publicity department maintained by the Kansas City (Mo.) Railways is that it is answering many queries and complaints to the newspapers directed against the car service. One of the newspapers conducts a "Speaking the Public Mind" column, where, in the past, criticisms of the company were published. Recently the editor of that department has been sending some of the communications to the railway company and its publicity department provides the correct information even though the response must be the frank admission that an employee had exceeded his authority or that the condition was one which had not yet been remedied though a solution was being sought.

Hearings Begun on Freight Advance.—The Public Service Commission for the Second District of New York on June 23 began its investigation of the 15 per cent advance in freight rates proposed by the carriers of the State. All the railroads operating in the State were represented and produced copies of statements filed with the Interstate Commerce Commission showing approximate estimates of increased cost of coal, labor and material and estimates of prospective earnings on the proposed advanced rates, using the business of 1916 as a basis and following along the same lines of proof as they did before the Interstate Commerce Commission. The hearing has now been closed and the interested parties have received permission to file briefs not later than June 27 to support their contention.

H. C. L. Kills the Louisville Jitneys.—Competition of the jitney with the Louisville (Ky.) Railway will formally fade away on July 1, according to an announcement made by the Louisville Jitney Bus Company to the effect that the high cost of living has rendered the venture unprofitable. It is understood that thirty-four buses are authorized to operate under the blanket liability bond carried by the company. During the two years since the buses began to operate gasoline has advanced in price from 9 cents to 24 cents with the result that the business has not been profitable. Operators have been dropping out until service is given on only two instead of on all of the principal streets of the city as formerly. It is said that some free-lance buses are in operation that do not observe the city ordinance requiring a $5,000 liability bond, but they do not constitute serious competition.

Trials of "Free-Bus" Operators Begun.—Lester Thayer, first of the seventy-nine jitney drivers on trial in Seattle, Wash., charged by the Puget Sound Traction, Light & Power Company with operating without the $2,500 bond required by law, was discharged by Justice Otis Brinker after he had produced an alibi. Thayer was charged with having carried for hire in his "free-donation" bus, O. A. Wise, an investigator for the traction company, on June 1. Thayer proved that he was not operating his bus on that date. Judge Brinker announced that the other seventy-eight cases will be taken up as soon as possible. Attorneys for the defendants say that they will demand a separate trial and jury in each case. Arrests of jitney drivers for the second and third times on criminal charges for operating without a surety bond have been discontinued. The prosecuting attorney of King County gave notice to the Puget Sound Traction, Light & Power Company that no more complaints would be issued by his office against jitney drivers who were already at liberty under bond charged with having violated the bonding law.

Legal Notes

CHARTERS, ORDINANCES, FRANCHISES

FEDERAL COURTS.—*Generating Electric Power for Railway Service is Public Use Even if There is a Sale of Surplus Power.*

The condemnation of certain water rights by a street and interurban railway company, conformably to the local law, cannot be said to be for a private use, on the ground that the contemplated works will produce much more power than will be needed for the railway, when the company's charter empowers it to sell the surplus power and the taking, according to the findings of the state courts, was with intent in good faith to carry on the public business authorized by the charter, *i. e.*, to build and operate a railway between points named, and it was further found that it was necessary to generate electric power on the stream in order to operate the railway, and that, in order fully to develop the company's water power for such purpose, it was necessary to condemn the rights in question. (Hendersonville Light & Power Company and Saluda-Hendersonville Interurban Railway v. Blue Ridge Interurban Railway, 37 Supreme Court Rep., 440.)

NEW YORK.—*Power House Repair Shop a "Factory," and Hours of Rest Are Required.*

The labor law defines a "factory" as including any mill, workshop, or other manufacturing or business establishment, where one or more persons are employed at labor, except power houses, generating plants, barns, storage houses, sheds, and other structures owned or operated by a public service corporation, other than construction or repair shops. Defendant, a subsidiary corporation of a city rapid-transit company, maintained in the basement of its power house a machine shop, operated by power, where repairs were made and small parts manufactured and kept in stock. The machinists assembled parts and adjusted them when machines broke down. Held, that such machine shop was a factory, within the statute requiring twenty-four consecutive hours of rest in every calendar week. (People v. Transit Development Company, 165 New York Sup., 114.)

LIABILITY FOR NEGLIGENCE

KENTUCKY.—*Trespass Committed When Car Left Track.*

Where defendant's street car left the track and ran into the house of plaintiff, thereby injuring her, a trespass was committed, and she may recover without showing negligence on the part of the motorman. (Kentucky Traction & Terminal Company v. Grimes, 194 Southwestern Rep., 1048.)

PENNSYLVANIA.—*Beginning of the Passenger Relation.*

One boarding a street car intending to become a passenger, even though no fare has been collected before he sustains injury, is a passenger, and not a trespasser simply because he entered in an illegal manner and in violation of company's rule. (Berkebile v. Johnstown Traction Company, 99 Atlantic Rep., 871.)

WEST VIRGINIA.—*Federal Employers' Liability Act Does Not Apply to Employees in City Service of Interstate Line.*

An electric railway company which operates an urban car line, and also other lines connecting therewith and extending into another state, is both an intrastate and in interstate carrier. But the federal employers' liability act (Act Cong. April 22, 1908, Chap. 149, 35 Stat. 65 [U. S. Comp. Stat. 1913, Secs. 8657-8665]), does not apply in the case of injury to a servant of such company, who is operating a street car, confined to the urban lines and not, at the time of injury, carrying interstate passengers or traffic. To make the federal act applicable, the injured servant must be engaged in interstate commerce at the time of injury. (Watts v. Ohio Valley Electric Railway, 88 Southeastern Rep., 659.)

Personal Mention

T. G. Lowry has been appointed chief engineer of the Peoria (Ill.) Railway Terminal Company.

R. A. Becker has been appointed engineer of overhead construction for the Southern Illinois Light & Power Company, Hillsboro.

J. K. Blish has been elected vice-president of the Galesburg & Kewanee Electric Railway, Kewanee, Ill., succeeding H. W. Crane.

John Roach has been appointed roadmaster of the East St. Louis & Suburban Railway, East St. Louis, Ill., succeeding J. C. Dew.

John H. Boyd has been appointed treasurer of the Uncanoonuc Incline Railway & Development Company, Manchester, N. H.

James G. White, president of J. G. White & Company, Inc., New York, has been elected second vice-president of the Merchants' Association of New York for the coming year.

Paul Reinking, who for several years has been auditor of the Fort Wayne & Decatur Traction Company, Decatur, Ind., has resigned to take a position with the Fort Wayne Corrugated Paper Company.

A. H. Cady has been made acting superintendent of the Detroit, Jackson & Chicago Railway, Detroit, Mich., in the place of William J. Dawson, who has been placed in temporary charge of the employment department of the Detroit United Railway, which controls the former company.

William J. Dawson, superintendent of the Detroit, Jackson & Chicago Railway, which is controlled by the Detroit (Mich.) United Railway, has been appointed acting superintendent of employment of the latter company, succeeding A. F. Brown, who has been kept from his duties on account of illness.

A. B. Coryell, who for the last four years has been superintendent and purchasing agent for the Moncton Tramway Electricity & Gas Company, Moncton, N. B., has resigned, effective July 1, to enter business for himself in Buffalo, N. Y. Mr. Coryell has been engaged in electric railway and lighting work for more than twenty-five years. During this time he has had charge of the construction and management of properties in different parts of the country, mainly in the southern states.

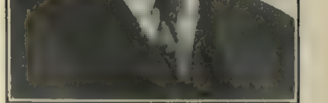
E. C. Macy has been appointed engineer of the Stone & Webster division of construction and engineering, with headquarters in Seattle, Wash., succeeding W. L. Locke. Mr. Macy has for many years been connected with the construction forces of the Stone & Webster organization. He had charge of the construction of the Seattle-Everett interurban road and the Bellingham-Mount Vernon line of the Pacific Northwest Traction Company. Mr. Macy was also associated with Chief Engineer S. L. Shuffleton in the construction of the large steam generating plant at Buffalo, N. Y., carried out by the Stone & Webster Engineering Corporation.

Sir Albert H. Stanley, who resigned last December as managing director of the London Underground Electric Railways, London United Tramways, Ltd., Metropolitan District Railway and the London General Omnibus Company, London, Eng., to accept the appointment as minister of commerce and president of the Board of Trade in the British Cabinet, was the subject of a recent communication to the Philadelphia *Public Ledger*. Many instances in the life of Sir Albert are quoted to portray his career in public service work in America before he went to England. The article states that in his opinion English industries and public utilities have profited much from American methods and that they receive more co-operation from the British public than do American industries from our mixed population. It is said that Sir Albert's American business experience and his everlasting ambition to "get on top" were determining factors in his appointment to a place in the Cabinet.

J. T. Hutchings, who has been general manager of the Rochester Railway & Light Company, Rochester, N. Y., since 1909, has, in addition to his present position, been elected vice-president of the company. During his connection with the company he has been instrumental in building up the property to its present prominent position and has greatly improved the company organization. Mr. Hutchings is a graduate of the Massachusetts Agricultural College at Amherst. For a short period after his graduation he was engaged in construction work for the Thomson-Houston Electric Company and later became assistant superintendent of the Germantown Electric Light Company. In 1891 he accepted a similar position with the West End Electric Company of Philadelphia and later was appointed superintendent. When this company was consolidated with others in 1897 as the Philadelphia Electric Company Mr. Hutchings was appointed electrical engineer and continued in that position until 1904, when he became connected with the Rochester Railway & Light Company as superintendent of the electrical department. Two years later he was appointed assistant manager and in 1909 general manager.

J. B. Potter, who has been manager of the New York & Stamford Railway, Port Chester, N. Y., for the last ten years, has resigned, effective July 1, to accept a position with Sanderson & Porter, engineers, New York. Mr. Potter was with that firm from 1898 to 1900 in the capacity of constructing engineer in charge of the construction of an electric railway from Central Village, Conn., to Webster, Mass. His first work in the railway field was with the Westinghouse Electric & Manufacturing Company in the year 1897. In 1900 Mr. Potter was appointed manager and treasurer of the Webster & Dudley Street Railway and after two years in this capacity he was made, in addition, manager of the Worcester & Webster Street Railway properties. These remained under his management until September, 1903, when the two companies were leased to the Worcester & Connecticut Eastern Railway and Mr. Potter was made general superintendent. This company was afterward known as the Consolidated Railway, Putnam Lines. He was appointed general superintendent of the Worcester & Southbridge Street Railway Company in addition to his duties as general superintendent of the Putnam Lines of the Consolidated Railway in the year 1905 and held that position until his appointment as manager of the New York & Stamford Street Railway and the Stamford Lines of the Consolidated Railway in 1907. In his new position Mr. Potter will have charge of the operation of the public utilities in which Sanderson & Porter are interested.

Wilbur C. Fisk, president and general manager of the Hudson & Manhattan Railroad, New York, was honored on June 27 by election to the presidency of the New York Electric Railway Association to succeed James P. Barnes. He has just completed a term as vice-president of the association, and this, together with active committee work, has prepared him adequately for the greater responsibilities as president. Mr. Fisk is a native of New York, having been born in New York City on Feb. 22, 1868. He was graduated from Princeton University in 1890 with the degree of civil engineer and afterward entered the banking house of Harvey Fisk & Sons, New York, founded by his father, Harvey Fisk. He became a member of the firm in 1898. Soon after Harvey Fisk & Sons undertook the financing of the Hudson & Manhattan Railroad at the request of the directors and William G. McAdoo, then president, Mr. Fisk was elected vice-president of the company. In 1908 he assumed also the duties of general manager and had entire control of the operation of the road. When Mr. McAdoo became Secretary of the Treasury under President Wilson Mr. Fisk was elected president of the Hudson & Manhattan to succeed him.



W. C. FISK

B. W. ARNOLD

B. W. Arnold, as noted last week, is the new manager of the Eastern Wisconsin Electric Company, which consists of the railway property in Oshkosh and the interurban lines in Neenah, Omro and Fond du Lac, including the Fond du Lac city line. Mr. Arnold began railroad work in 1899 with the Wheeling & Lake Erie Railway, and later entered the employ of the Lake Shore Electric Railway, Cleveland, Ohio, as train dispatcher. He resigned in 1902 to become chief dispatcher of the Muncie, Hartford & Fort Wayne Railway, Muncie, Ind., and continued in that position until 1907, when he entered the service of the Illinois Traction System, McKinley Lines, as superintendent of the southern division. Mr. Arnold continued in that capacity for a time, with headquarters at Springfield, and was later transferred to Decatur as superintendent of the Decatur division in charge of all lines running into that city. He was next made chief clerk to the general superintendent of the system, and in 1910 was appointed superintendent of transportation of the Chicago, Ottawa & Peoria Railway, the northern division of the Illinois Traction System, which position he has held until the present time.

E. R. Kelsey, advertising manager of the Toledo Railways & Light Company, Toledo, Ohio, one of the H. L. Doherty properties, returned recently from points in North Carolina, Georgia, Oklahoma and Missouri where he visited other companies of the Doherty organization. Mr. Kelsey has collected information for a series of service talks which he intends to prepare.

Obituary

John Lane, formerly superintendent of the Boston & Northern Street Railway, now known as the Bay State Street Railway, Boston, Mass., died recently at his home in Providence, R. I.

Edward E. Higgins, from 1893 to 1900 co-editor of the STREET RAILWAY JOURNAL, died on June 22, at Clinton, Conn. He had been seriously ill for about two weeks. Mr. Higgins was born in Chelsea, Mass., in 1864 and was graduated from the Massachusetts Institute of Technology in its electrical engineering department in 1886. His first connection with the electrical industry was as assistant electrician of the Standard Electric Company of Vermont. In 1888 he joined the sales staff of the Sprague Electric Railway & Motor Company and continued with its successor, the Edison General Electric Company, until 1891, when he accepted the management of the Short Electric Railway Company. This company, a few years before, had been incorporated by Sidney H. Short to build and install electric railways. After the sale of this company to the Westinghouse Electric & Manufacturing Company, about a year later, Mr. Higgins traveled extensively abroad, and on his return to the United States he opened an office in New York as street railway and financial counsel. This led to the contribution of a series of articles to the STREET RAILWAY JOURNAL on street railway investments. These articles were afterward republished in book form, and Mr. Higgins was invited to become one of the editors of the paper. During this connection he specialized on the financial side of electric railway operation, and in 1894 largely due to his initiative, the *Street Railway Red Book,* later known as the *McGraw Electric Railway Manual,* made its appearance as an annual publication. He retired from the STREET RAILWAY JOURNAL in 1900, following the purchase by him and others of the controlling interest in the magazine *Success.* Recently Mr. Higgins has been vice-president and treasurer of the Moore-Cottrell Subscription Agencies.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Columbus, Delaware & Marion Electric Company, Columbus, Ohio.**—Incorporated to take over the Columbus, Delaware & Marion Railway, recently sold under foreclosure to Ralph Beaton, Columbus. Capital stock, $1,000, to be increased to a much larger amount. Incorporators: Samuel L. Finn, Daniel Blau, I. Webb, Ira Cranford and M. F. Sheeler.

FRANCHISES

Syracuse, N. Y.—The New York State Railways has applied to the Public Service Commission for the Second District of New York for its approval of franchises for a number of minor improvements in its track systems in Syracuse to facilitate the operation of the new single-end cars.

Tonawanda, N. Y.—The Public Service Commission for the Second District of New York has approved the extension by the International Railway of its Grand Island Ferry line along the River Road to the Wickwire Steel Company's plant.

Dayton, Ohio.—The Peoples Railway has asked the City Commission for permission to extend its line on the Covington Pike to a point beyond Fairview. The cars are now being operated to the point to which it is desired to extend the line through an arrangement with the Dayton, Covington & Piqua Traction Company.

East Cleveland, Ohio.—The City Council of East Cleveland has approved a twenty-five year franchise to the Cleveland Railway in East Cleveland. The franchise will be submitted to a referendum vote on July 1. The company is to pave its portion of the streets, extend the Superior Avenue line to Euclid Avenue and build a crosstown line on a location yet to be fixed.

Pomeroy, Ohio.—The Ohio River Electric Railway & Power Company has asked the City Council for a new twenty-five year franchise in Pomeroy.

TRACK AND ROADWAY

Municipal Railways of San Francisco, San Francisco, Cal.—Bids were recently opened by the Board of Public Works for the construction of the Municipal Railway line through Twin Peaks tunnel and out to the junction of Junipero Serra and Sloat Boulevards, the lowest bidder being Eaton & Smith, San Francisco, at $80,467.

Delaware & Maryland Traction, Light & Power Securities Company, Wilmington, Del.—This company has secured the franchises of the Fox Creek Railroad Company, of Dorchester County, and the Peninsula Traction Company, of Talbot County, and proposes to construct an electric line to connect Cambridge with Bishop's Head, on the Chesapeake Bay, and a line connecting the principal points on the Eastern Shore with Elkton. The line is expected to pass through Chestertown, Centreville, Church Hill, Denton, Easton, Hurlock and East New Market. The Fox Creek Railroad Company secured a charter about twenty years ago and a bond issue of $90,000 was voted by the county to purchase stock in the road, but it has never been built. It is said that the company also proposes to construct a line from Wilmington to Salisbury, with a branch line from Bridgeville to Williamsburg, and thence to Easton. Lindes & Company, Philadelphia, are interested. [June 23, '17.]

Seaboard Air Line Railway, Savannah, Ga.—This company has inaugurated a gas-electric train service between Savannah and Jacksonville, eliminating the steam service between these two points.

Union Traction Company, Anderson, Ind.—Extensive improvements are being made by the Union Traction Company in its roadway equipment in and around Fort Benjamin

Harrison. The right-of-way between Indianapolis and the fort is being double-tracked between Long's siding to Keystone, near the fair grounds. This will give the company 7 miles of double track between Indianapolis and the fort and will greatly facilitate the handling of cars. Other improvements also are being made to enable the company to better the service and handle a great amount of trains to and from the army post during the training camp period.

Manhattan City & Interurban Railway, Manhattan, Kan.—This company reports that it expects to erect a new steel bridge, possibly using a second-hand deck girder bridge of about 50 to 600 ft. length.

Louisville (Ky.) Railway.—Definite announcement by the Louisville Railway as to its plans for the extension of service to the army camp which will be established in Louisville are being delayed pending the decision of the Fiscal Court of the county on application of the company for a franchise. This is involved also with the matter of final platting of the camp grounds. Meanwhile the company is going ahead with preparations for beginning construction as soon as the route is decided on.

Northern Massachusetts Street Railway, Athol, Mass.—Plans are being considered for an electric freight line to extend from Gardner to Templeton, connecting there with the Boston & Albany Railroad. If these plans go through the Parker Street railroad bridge may have to be altered to a great extent in order to allow freight cars to pass beneath it. It is understood that the problem of fixing the tracks to make them fit for freight service is soon to be turned over to the engineering department.

Mesaba Railway, Virginia, Minn.—This company contemplates replacing its wooden poles with steel poles in Gilbert.

United Railways, St. Louis, Mo.—The Chouteau Avenue viaduct over the Missouri Pacific and Frisco railroad tracks, between Spring and Vandeventer Avenues, has been opened to street car traffic. The viaduct is about 1000 ft. long and cost more than $200,000. It was built by the city, but paid for by the two railroads and the United Railways.

Public Service Railway, Newark, N. J.—This company plans to construct a line on Avenue R from the Lincoln Highway to Port Newark Terminal.

New York & Queens County Railway, New York, N. Y.—The project to construct a line through Peartree and Roosevelt Avenues, Corona, which was to have connected Jackson Avenue with the Alburtis Avenue terminal of the Corona elevated line, has been abandoned by the New York & Queens County Railway as a result of protests by residents of Roosevelt Avenue, who objected to having the line run through their thoroughfare.

Youngstown & Niles Railway, Youngstown, Ohio.—A contract has been awarded by the Youngstown & Niles Railway to J. W. Garland, Inc., Ravenna, for grading the roadbed of its proposed line from Youngstown to Niles. This will be a single track electric line about 6 miles long and will pass through the new town of MacDonald, where the Carnegie Steel Company is erecting a new steel plant and building a new town site for the housing of its workers. The contractor plans to sublet some of this work. [Feb. 10, '17.]

St. Thomas (Ont.) Street Railway.—It is reported that the St. Thomas Street Railway plans the construction of an extension to cost about $40,000.

Toronto (Ont.) Civic Railway.—The City Council of Toronto will call for bids for the construction of the proposed Bloor Street extension.

Klamath Falls (Ore.) Municipal Railway.—The City Council of Klamath Falls has formally accepted the bid and awarded the contract to Robert E. Strahorn, Portland, at $300,000, for the construction of a municipal railway from Klamath Falls to Dairy, 20 miles, and for certain equipment and rolling stock specified. [May 12, '17.]

Rhode Island Company, Providence, R. I.—This company plans to construct double track on Chalkstone Avenue from Smith Street to Lisbon Street.

Austin (Tex.) Street Railway.—Work will soon be begun by the Austin Street Railway on the construction of an extension to Travis Heights. It is expected that the line will be in operation by Aug. 15.

Willapa Electric Company, Raymond, Wash.—The City Council of South Bend has notified the Willapa Electric Company that it must pave between its tracks on Upper Water Street. Three years ago the Council permitted the company to plant between the rails on its plea that the street grade had not settled enough to make it possible to put in paving which would stand wear.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—The extension of a double-track street car line to the site of the American Lake (Wash.) Cantonment near Tacoma, is receiving consideration by officials of the Stone & Webster interests in Tacoma and Seattle. A conference was held recently between W. A. McGrath, vice-president of the Puget Sound Traction, Light & Power Company, and other officials of the company and Major Stone, Capt. H. M. Smitten, chief assistant, and his advisers. The government favors the extension of car service between Tacoma and the new cantonment at the earliest possible date. Tremendous problems of transportation for the thousands who will want to reach Tacoma from the post would be greatly simplified by a street car service. The Pacific Highway, while providing a present good means of connection, will become congested with hundreds of automobile buses and the great number of automobile trucks and delivery machines connected with the business of the post. Traction officials agreed at the conference to take the matter of the extension of its lines under immediate advisement and reach conclusions as soon as possible. Should the company conclude to construct double-track extensions, it will mean the expenditure of several hundred thousand dollars.

Tacoma (Wash.) Municipal Railway.—An ordinance was recently introduced in the City Council authorizing the issuance of $180,000 of city utility bonds to provide funds to build and equip the proposed municipal line to the Todd shipyards on the tideflats. The line may be single or double track. C. D. Atkins, commissioner of public works, is placed in charge of construction.

SHOPS AND BUILDINGS

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—Plans are being made by the Chicago, North Shore & Milwaukee Railroad for the construction of a new station at Great Lakes.

Kansas City, Mo.—Mayor Edwards of Kansas City has vetoed the ordinance locating the proposed union station for the use of interurban railways at the northeast corner of McGee and Tenth Streets.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, Pa., William S. Twining, director, until 12 o'clock noon, on July 10 for the construction of five stations along the line of the Frankford elevated railway. Copies of plans and specifications may be obtained upon deposit of $10, to be refunded upon return of plans.

Texas Electric Railway, Dallas, Tex.—This company will erect a $50,000 to $100,000 union interurban express terminal for the Electric Express Company.

POWER HOUSES AND SUBSTATIONS

Pacific Gas & Electric Company, Sacramento, Cal.—An additional power house will be erected by the Pacific Gas & Electric Company about 600 ft. below the Spaulding Dam, where 5000 hp. will be generated under a 173-ft. head of water. The proposed plant will cost about $125,000.

Manhattan City & Interurban Railway, Manhattan, Kan.—This company reports that it expects to purchase a new or second-hand 200 or 300 kw. rotary converter.

Atlantic Coast Electric Railway, Asbury Park, N. J.—A report from this company states that it is installing four Badenhausen water tube boilers of 610 hp. each, in two batteries, one-half of which will be completed about July 15.

Marion Railway, Light & Power Company, Marion, Ohio.—Extensive improvements are being made to the power plant of this company. They include the installation of a Heine steam boiler, large steam turbine, surface condenser, air pump, circulating pump, etc. A new cooling system will replace the old pipe spray system. The cost of the system is estimated at $37,000.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Market Quotations Business Announcements

Settling for Defective Equipment

Neither Party Should Suffer Unduly—Unreasonable Requests Stifle Development—A 50-50 Case Is Cited—Consequential Damages Paid

Manufacturing companies are very jealous of their reputations in the fields which they serve, and for that reason examples are rare of their failure to make good any and all requirements of recognized specifications. But once in a while it falls to the operating engineer to put in a claim against a manufacturer on account of the failure, for a time at least, of certain equipment to give satisfactory service. No general rule can be laid down as to the proper procedure in such cases, for the terms of the contract naturally govern the negotiations in a broad sense. On some occasions it has been found necessary to remove the equipment before acceptance was possible, and in this event the main point is to see to it that the purchaser does not suffer unduly for the trial. Yet the railway company naturally wishes to be entirely fair to the manufacturer, particularly if he puts forth strong efforts to remedy the defects encountered in service.

Most every engineer appreciates the amount of money and effort that the manufacturers of electrical and steam machinery have at times been called upon to spend to make good on guaranteed performances. Certainly the spirit of the manufacturers to fulfill contracts is well known, yet one hears frequently of cases in which the evidence would seem to indicate that some customers have attempted to saddle on to the manufacturers charges that should have been classed as maintenance expense. Not infrequently the manufacturers are asked to make good damaged apparatus that has been in service for a year or more longer than the guarantee period. Sometimes they do it, then charge it to good policy, to competition, or to the sales expense of the next order.

ADJUSTING DIFFERENCES BETWEEN MANUFACTURER AND PURCHASER

The adjustment of differences arising from the interpretation of specifications is always a difficult task and sometimes requires an arbitrator. The time to avoid these differences is, of course, when the contract and specifications are being drawn. At that time the policy of the seller should be definitely expressed regarding the possible payment of damages for loss to the purchaser occasioned by failure of the manufacturer to make delivery on time or the failure of the apparatus to show on test the degree of efficiency called for in the contract.

Since the producers have been so busy lately, it is noted that more companies than heretofore refuse to accept liability for consequential damages, particularly where these are in the form of damages for delayed deliveries.

In discussing this subject of the adjustments effected between buyers and sellers, it should be remembered that upon the spirit of fairness displayed by the buyers will largely depend the willingness of the manufacturer to continue to spend great sums for the development of new apparatus. Still another element to be considered is the fact that the manufacturers have been asked by railway executives to make good so-called defective apparatus which has been damaged through carelessness of the operating staff. And, too, the purchase of standardized products places upon the manufacturer a greater responsibility for making good all defects than would seem to rest upon him when the purchaser has insisted on changes being introduced into the design.

All of these elements are generally recognized, but the citation of one case may be informative. In this instance many months elapsed before a generating unit could be utilized satisfactorily in regular service; so the purchaser's engineer estimated the increased fuel consumption for the period in which the company was obliged to use machines of lower efficiency, and a compromise was made on a "50-50" basis. This brought the owner of the unit nearly $20,000. There was no doubt that the purchaser burned the extra coal, and of course the work of his staff was somewhat increased by the tests and experiments necessary to put the unit in first-class condition. Probably the payroll was not increased seriously, and the compromise solution doubtless was fair to both parties.

Where such estimates are prepared to show the cost to the purchaser of being deprived of a given service for a considerable period, it is desirable that the computations be preserved in a form which will permit easy checking by an arbitrator. The rule of reason should not be forsaken in cases involving the installation of equipment with which the maker, in good faith, is endeavoring to live up to specifications; and petty claims for inconvenience or trifling losses are not worth their trouble. There is a middle ground between sharp practice and easy-going tolerance of real and substantial losses, which can be traversed in most cases with mutual respect and satisfactory relations between the parties concerned.

Fare Register Production Cost Increases

Comparisons Are Made Showing Changes Since Last Year—Wage Scale Shows 40 Per Cent Increase in Three Years

Some of the difficulties with which the manufacturer of fare registers has had to contend during the last three years were set forth in an interview with John F. Ohmer, president of the Ohmer Fare Register Company, Dayton, Ohio, and published in this department of the ELECTRIC RAILWAY JOURNAL for Dec. 9, 1916. At that time it was noted how the abnormally high material prices had enforced conditions upon the manufacturers which had been hard to meet. Attention was called to the increasing difficulties of the paper supply situation, and some interesting facts were given regarding the purchase and preparation of paper rolls suitable for use in recording fare registers.

Mr. Ohmer states that since his earlier interview there have been notable changes in the prices of many of the essentials in fare register manufacture. Some of these are of particular interest. For example, by comparison with the conditions of last October, manufacturing steel has advanced about 15 per cent, brass and aluminum have remained normal, gray-iron castings have advanced 10 per cent, high-speed tool steel has decreased about 20 per cent, and general supplies have advanced an average of from 15 to 20 per cent, while register paper, a most important item, has advanced 48 per cent. The high price of fuel has been sustained, and the indications are that the price will go still higher.

WAGES STILL SKYROCKETING

Because of the proportionately large number of expert mechanics required, the labor cost for fare register manufacture is relatively high, and the great increases of the last few years have brought about conditions heretofore never contemplated. With regard to present wages and the possible future conditions, Mr. Ohmer may be quoted as follows: "A careful analysis of our records shows that our average wage scale in December, 1916, had increased 22.4 per cent over the average wage scale of 1914. Our wage schedule for May, 1917, shows an average increase for 312 men of 14.6 per cent over the month of December, 1916, and, as compared with the month of May, 1914, our wage schedule for May, 1917, shows an increase of more than 40 per cent. A large majority of our employees are high-grade machinists and tool makers, and our average is perhaps above the general average.

"Since the declaration of war against Germany, followed by uncertainties as to the result of pending legislation which may seriously affect material and labor, there seems to be a tendency to economize along many lines of industry, and until the large appropriations made by our government begin to circulate freely in payment for materials and equipment, we must expect some considerable depression in business."

Standardizing Trade Literature

In connection with the standardization of trade literature, on which a number of articles and comments have appeared recently in these columns, a committee appointed by the Associated Manufacturers of Electrical Supplies has recommended that the dimensions 8 in. x 10½ in. be adopted as standard for catalogs, letter paper, contract forms, bulletins, specifications and engineering forms for the following reasons:

A large portion of the manufacturers would be glad to adopt any standard dimensions recommended by the committee.

The 8-in. x 10½-in. sheet has approximately 10 per cent less paper than the 8½-in. x 11-in. One manufacturer estimates that this item alone will save his company $12,000 a year, and all manufacturers are vitally interested in a saving of this nature.

Our investigations indicate that these dimensions have been adopted as the United States government standard.

As a rule photographs of electrical apparatus are made on 8-in. x 10-in. plates and the finished prints can be easily trimmed to 8-in. x 10½-in.

The American Institute of Architects has recommended the size of 8 in. x 10½ in. for all catalogs of building material. A thin catalog of this size when folded once will fit readily the average pocket, whereas a 6-in. x 9-in. catalog when not folded will not fit in the pocket.

The Electrical Supply Jobbers' Association has adopted as the standard for its loose-leaf catalog a page 8 in. x 10½ in.

This size of sheet for letter paper, catalogs, etc., will file much more readily in standard letter files than will the larger size.

In addition to the actual saving in paper mentioned, there would be an additional saving in envelops and a very great saving in postage, due to reduced shipping weight of catalogs. The question of postage will probably become a very serious matter of expense to the manufacturer in the near future and should receive careful consideration.

Increase in Coal and Coke Shipments for May

The number of carloads of bituminous coal originating on eighty-two railroads during the month of May, 1917, as compiled from a report received by the Geological Survey, Department of the Interior, was 739,674 as compared with 657,809 in April of 1917 and with 597,517 for May of 1916. Shipments originating on eleven roads in central Pennsylvania, Maryland and the New River and Pocahontas fields of West Virginia and Virginia amounted to 186,249 carloads, which was the largest amount from any of the seven districts included in the report. The increase in the shipments of bituminous coal in May, 1917, compared with April, 1917, was 12.4 per cent, and compared with May, 1916, it was 23.8 per cent. The daily average of cars loaded in May, 1917, was 28,429 as compared with 26,312 in April, 1917, and 22,981 in May, 1916.

Carloads of beehive coke originating on sixteen roads during the month of May, 1917, amounted to 75,528 as compared with 72,222 for April, 1917, and 76,096 for May, 1916. The May shipments of 1916 showed an increase of 4.6 per cent over April, 1917, and a decrease of 0.75 per cent as compared with May, 1916.

War Demand for Lumber Will Not Disturb Market

Enormous Amount Needed for Army Purposes Is Only Small Per Cent of Annual Production

The lumber committee of the advisory commission, Council of National Defense, has estimated that 2,000,000,000 ft. of lumber will be used in the next twelve months for purposes directly connected with the war. While this is a colossal order and will bring added prosperity to the lumber industry, it should give no apprehension that it will disturb the markets or cause any shortage of lumber. Large as this amount is, it will not exceed 5 per cent of one year's lumber production in the United States.

The committee representing the Southern Pine Association recently announced that Gen. George W. Goethals had placed an order for lumber for 100 ships, to be sawed by the Southern mills at an average price of $35 per thousand feet at the mills. Approximately 140,000,000 ft. of lumber will be required for these 100 ships.

New Westinghouse Vice-Presidents

As noted briefly in last week's issue, H. D. Shute, H. T. Herr and Walter Cary have been elected vice-presidents of the Westinghouse Electric & Manufacturing Company. Mr. Shute was graduated from Massachusetts Institute of Technology with the class of 1892. He became associated with the Westinghouse company the following year, and after spending two years in the testing department became associated with L. B. Stillwell. After some time spent on construction and design work he entered the sales department, in which he remained until 1903, when he was made assistant to Vice-President L. A. Osborne. He filled this position for about seven years, when he was elected acting vice-president. In 1914 he was made treasurer of the company, succeeding T. W. Siemon.

Herbert Thacker Herr has been connected with the Westinghouse Machine Company since 1908, holding respectively the positions of general manager, second vice-president and finally vice-president and general manager. He received his education in the public schools in Denver and at Yale University. After leaving college he became identified with a number of railroads, serving in various capacities, and in 1906 was made general superintendent of the Denver & Rio Grande Railroad. Two years later he became vice-president and general manager of the Duquesne Mining & Reduction Company, which position he held until he moved to Pittsburgh.

Walter Cary has, since 1904, been associated with the Westinghouse Lamp Company, filling for the greater part of the time the position of vice-president and general manager. He received his education in the city schools of Milwaukee and at Harvard University. Later he became secretary of the Gibbs Electric Company of Milwaukee, and in 1899 with other local men formed the Milwaukee Electric Company, becoming its vice-president and, in 1902, president.

Railroads' War Board Helps to Reduce Car Shortage

The shortage of freight cars in the United States was reduced during the month of May from 148,627 to 105,127 cars, almost 33⅓ per cent. This marked reduction in one month, following four months of rapid increase, is attributed to the prompt response on the part of both shippers and railroads to the specific suggestions which have been made by the railroads' war board as to how to secure more effective uses of existing freight equipment. Some of those suggestions are: Load cars 10 per cent in excess of marked capacity; reduce percentage of cars and locomotives under repairs; improve methods of firing locomotives; defer scrapping light locomotives; speed up handling of cars in terminals by prompt despatch of trains; load and unload promptly, and enlist co-operation of shippers, as a war measure, to secure heavier loading of cars.

The progressive improvement in the situation is indicated by the fact that on March 1 reports made by railroads to the American Railway Association showed a shortage in the entire country of 130,082 freight cars. The shortage grew to 144,797 by April 1, and on May 1, when the railroads' war board was just starting to operate all the railroads as a continental system with the aim of producing a maximum national transportation efficiency, the shortage had reached 148,627 freight cars.

NEW YORK METAL MARKET PRICES

	June 16	June 28
Prime Lake, cents per lb	32½	32½
Electrolytic, cents per lb	32½	32½
Copper wire base, cents per lb	36	36
Lead, cents per lb	11⅞	11¾
Nickel, cents per lb	50	50
Spelter, cents per lb	9¾	9⅝
Tin, Straits, cents per lb	60⅝	62
Aluminum, 98 to 99 per cent, cents per lb	61	61

OLD METAL PRICES

	June 16	June 28
Heavy copper, cents per lb	28	28½
Light copper, cents per lb	25½	25½
Red brass, cents per lb	17½	17½
Yellow brass, cents per lb	18	18
Lead, heavy, cents per lb	8¾	8¾
Zinc, cents per lb	7	7¼
Steel car axles, Chicago, per net ton	$48.00	$53.00
Old car wheels, Chicago, per gross ton	$36.00	$43.00
Steel rail (scrap), Chicago, per gross ton	$39.50	$48.50
Steel rail (relaying), Chicago, per gross ton	$42.50	$53.50
Machine shop turnings, Chicago, per net ton	$18.00	$20.00

CURRENT PRICES FOR MATERIALS

	June 16	June 28
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40.00	$40.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$3.20
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$4.00	$4.50
Steel bars, Pittsburgh, per 100 lb	$4.40	$4.50
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$7.35	$7.90
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$9.05	$9.30
I-beams over 15 in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.85
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.85
Cement (carload lots), New York, per bbl	$2.40	$2.40
Cement (carload lots), Chicago, per bbl	$2.31	$2.31
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.18
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.19
White lead (100 lb. keg), New York, cents per lb.	12¼	12¾
Turpentine (bbl. lots), New York, cents per gal.	44	43

ROLLING STOCK

Mason City & Clear Lake Railroad, Mason City, Ia., has purchased five one-man safety cars.

Kankakee & Urbana Traction Company, Kankakee, Ill., is in the market for a standard trail car.

Birmingham Railway, Light & Power Company, Birmingham, Ala., noted in the May 5 issue as purchasing twelve double-end, closed motor cars through the United Gas & Electric Corporation, has specified the following details for this equipment:

Number of cars ordered	12
Date of order	April 27, 1917
Date of delivery	Oct. 1, 1917
Builder	J. G. Brill
Type	Closed motor
Over bumpers	47 ft. 8 in.
Over corner posts	34 ft. 8 in.
Over all	8 ft. 7 in.
Rail to trolley base	11 ft. 1 in.
Body	Semi-steel
Interior trim	Cherry
Headlining	¼-in. Nevasplit
Roof	Arch
Air brakes	Westinghouse
Axles	Hammered steel
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Control	Westinghouse
Curtain fixtures	Forsythe No. 88
Curtain material	Pantasote No. 86
Designation signs	Keystone, Ill.
Door mechanism	Burdette Rowntree
Fenders	H. B. lifeguards
Gongs	12-in. Brill Dedenda
Heaters	Consolidated Car Heating
Headlights	Crouse-Hinds
Journal boxes	Brill
Lightning arresters	not placed
Motors	Four West. 506-A-2
Registers	International
Sanders	not placed
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn No. 300-A
Seating material	Cherry wood
Step treads	Amer. Abrasive Co.
Trolley catchers	Earle No. 7
Trucks	Brill 77-E-1
Ventilators	Railway Utility Co.
Wheels	So. W. Co. 26-in. cast iron
Special devices	Consolidated buzzer system, Ellcon stanchions, Railway Utility thermostats, Brill center and side bearings, Brill graduated spring system and Brill bolster guide arrangement.

Manhattan City & Interurban Railway, Manhattan, Kan., is in the market for several large double-truck double-end motor cars and several large trailers.

Knoxville Railway & Light Company, Knoxville, Tenn., noted in the May 5 issue as having had twelve double-end closed motor cars purchased for it through the United Gas & Electric Corporation, has specified the following details for these cars:

Number of cars ordered	12
Date of order	April 27, 1917
Date of delivery	Oct. 1, 1917
Builder	J. G. Brill
Type	Closed motor
Seating capacity	52
Over bumpers	47 ft. 8 in.
Over corner posts	34 ft. 8 in.
Over all	8 ft. 7 in.
Rail to trolley base	11 ft. 1 in.
Body	Semi-steel
Interior trim	Cherry
Headlining	¼ in. Nevasplit
Roof	Arch
Air brakes	West.
Axles	Hammered steel
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Control	West.
Curtain fixtures	Forsythe No. 88
Curtain material	Pantasote No. 86
Designation signs	Keystone, Ill.
Door mechanism	Burdette Rowntree
Wheelguards	H. B. lifeguards
Gongs	12 in. Brill Dedenda
Heaters	Consolidated Car Heating
Headlights	Crouse-Hinds
Journal boxes	Brill
Lightning arresters	not placed
Motors	Four West. 506-A-2
Registers	International
Sanders	not placed
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn No. 300-A
Seating material	Cherry wood
Step treads	Amer. Abrasive Co.
Trolley catchers	Earle No. 7
Trucks	Brill 77-E-1
Ventilators	Railway Utility Co.
Wheels	So. W. Co. 26-in. cast iron
Special devices	Consolidated buzzer system, Ellcon stanchions, Railway Utility thermostats, Brill center and side bearings, Brill graduated spring system and Brill bolster guade arrangement.

Northern Ohio Traction & Light Company, Akron, Ohio, has specified the following details for ten 33-ft. vestibuled single-end pay-within cars and for ten center-entrance trailers being built for it by the St. Louis Car Company.

	Single-End Pay-Within Cars	Center-Entrance Trailers
Number	10	Number 10
Name	N. O. T. & L.	N. O. T. & L.
Builder	St. Louis Car	St. Louis Car.
Type	Single-end	Center entrance.
Seating capacity	48	66.
Weight (total)	43,000 lb.	25,000 lb.
Truck centers, length	19 ft. 6 in.	28 ft. 0 in.
Length over bumpers	46 ft. 4 in.	46 ft. 8¾ in.
Length over corner-posts	33 ft. 0 in.	
Length over vestibule	45 ft. 4 in.	
Width over posts	8 ft. 5½ in.	8 ft. 2 in.
Sill to trolley base	8 ft. 5½ in.	8 ft. 11⅝ in.
Floor to ceiling	7 ft. 6 in.	
Body	Steel	Steel underframe.
Interior trim	Solid mahogany	Solid mahogany.
Head lining	3/16 in. agasote	3/16 in. agasote.
Roof	Turtle deck	Monitor.
Air brakes	Westinghouse	Westinghouse.
Axles		Forged open hearth.
Bumpers	Rico anti-climbers	Rico anti-climbers.
Car trimmings	Bronze	Bronze.
Conduits and junction boxes	St. Louis Car	St. Louis Car.
Control, type	GE. K-34	
Couplers	Tomlinson	Tomlinson.
Curtain fixtures	Forsyth No. 88	Forsyth No. 88.
Curtain material	Pantasote N-3	Pantasote.
Designation signs	Ill.—St. Louis Car	E. S. S. Co.
Door mechanism	Hand operated	Natl. Pneumatic.
Hand brakes	Ry. company's design	Ackley.
Heaters	Peter Smith No. 2-P	Peter Smith No. 2-P.
Headlights	Crouse-Hinds.	
Hand straps	Rico sanitary	
Journal boxes		St. Louis Car.
Motors	Four GE. 203 outside hung	
Paint	Murphy ABC	Murphy ABC.
Registers	International R-S.	
Sand box with Reliance	Sand trap valve	
Sash fixtures	O. M. Edwards	O. M. Edwards.
Seats	Hale & Kilburn	Hale & Kilburn.
Seating material	Rattan	Rattan
Springs	Pittsburgh Steel Spring Co.	Pittsburgh Steel Spring.
Step treads	Mason safety tread	Mason.
Trucks	Standard 0-50-0	St. Louis Car 118
Ventilators	Automatic	Deck Sash.
Wheels	33 in. Cast Iron	Cast iron 22 in. diam.
Special devices, etc.	Faraday buzzers, Perry side bearings, Ohio Brass Signals.	Faraday buzzers, Perry side bearings, rear end signals, Ohio Brass.

TRADE NOTES

Carbo Steel Post Company, Chicago, Ill., has moved its offices to 4-5 Transportation Building.

Hess-Bright Manufacturing Company, Philadelphia, Pa.: A bulletin on "Hess-Bright Ball Bearings," and how to apply them.

M. M. Moore, formerly with the machine tool department of Gaston, Williams & Wigmore, Inc., New York, has severed his connection with that firm and is now associated with the sales department of John W. Thorne & Company, Inc., 165 Broadway.

Cooper-Hewitt Electric Company, Philadelphia, Pa., has moved its offices from 124 South Eighth Street to the Drexel Building.

Standard Varnish Works, New York, N. Y., announces that its advertising department is now located at the main office, 90 West Street, New York City, and that in the future all matter pertaining to advertising should be directed to this new address.

Karl W. Bock, who for the last ten years has been secretary of and assistant to the vice-president of the Union Pacific Coal Company, Omaha, Neb., has been appointed manager of the Walter A. Zelnicker Supply Company, St. Louis, Mo.

Templeton-Kenly & Company, Ltd., Chicago, Ill., report that the recently improved flexible-type jack has broadened the jack market in the electric railway industry. Formerly the rigid-base jacks were purchased for use by the track and car-shop departments only. Now, with the development of the flexible-base jack, the line department has found many uses for them, and they are carried on trouble wagons. In consequence the sales to electric railway companies have been on the increase. Templeton-Kenly & Company report, for example, for their special pole-handling jack that large numbers have been sold to the American Telephone & Telegraph Company, that the Commonwealth Edison Company of Chicago has purchased more than 100, and that large shipments have been made to the Australian government telegraph system, to the Danish government telephone system, to practically all the public service properties in Hawaii, to the Connecticut Company and to the Public Service Company of New Jersey. The Illinois Traction System has also recently ordered these jacks for use on its line cars. The quality of materials used in jack manufacture is now high, and therefore the jack of to-day may be expected to do better duty and withstand more severe service than those manufactured some years ago.

NEW ADVERTISING LITERATURE

U. S. Electrical Manufacturing Company, Los Angeles, Cal.: A pamphlet on the Johnson electric grinding and buffing tool for machine shop and all-around general use.

Ohmer Fare Registering Company, Dayton, Ohio: A bulletin, "Getting Your Money," explaining methods of protecting your income and its source by the Ohmer system of fare protection.

Laclede-Christy Clay Products Company, St. Louis, Mo.: A pamphlet "All in the Same Boat." This is an appeal to all users of refractory materials to anticipate their orders six months in advance in order to insure deliveries.

Sprague Electric Works of the General Electric Company, New York, N. Y.: Bulletin 48700A on monorail hoists. Gives descriptions, illustrations and other data on the use of monorail hoists in shops, foundries and manufacturing plants.

Guaranty Trust Company, New York, N. Y.: A bulletin on "The Financing of American Foreign Trade," explanatory of the facilities offered to American and foreign banking institutions and to importers and exporters by the foreign department of the company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Bulletin No. 7193 on "Westinghouse Electrical Equipment for Ventilating Service." Types of motors and controllers adapted for this service are described and the amount of power required to drive different types of fans and blowers is also given.

Chicago Pneumatic Tool Company, Chicago, Ill.: Bulletin 34-Y on "Gas and Gasoline-Driven Air Compressors," descriptive of its class N-SG and N-SGL compressors. Longitudinal sections showing details of the construction and several pages of data on general dimensions for the different sizes of compressors are given.

Delta-Star Electric Company, Chicago, Ill.: Bulletin No. 31. Forty-eight pages on "High-Tension Indoor Universal 'Unit Type' Busbar Supports." Illustrates a number of installations of busbar and wiring supports, I-beam busbar supports, different types and mountings in modern compartments, dimensions of various types of busbar supports, combination switch and fuse, selective switches and unit type outdoor equipment.

Prest-O-Lite Company, Inc., Indianapolis, Ind.: A pamphlet "Prest-O-Lite Process," and apparatus for oxy-acetylene welding and cutting. Gives details of portable welding equipment, also details of parts. Contains useful data on costs, cutting results, oxygen and acetylene consumption per hour for different sizes of tips, etc.

Stroh Steel Hardening Process Company, Pittsburgh, Pa.: An attractive twenty-four-page bulletin on the Stroh process, which consists of casting fine alloy steel and soft steel in one solid piece. This process is used for hardening gears and pinions, mine car wheels, frogs, crossings and inserts, and many types of large castings.

Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio: A thirty-two-page bulletin, "Modern Methods of Brick Pavement Construction," for roads and streets built with wire-cut lug brick. Contains a brief review of the early history and of the evolution of the brick paving industry, a description of this company's standard brick and how it is laid, also its process of manufacture, engineering service rendered, and new paving methods now being employed. It also includes a number of testimonial letters from engineers, contractors and electric railway companies, including the Ohio Electric Railway, the Lake Shore Electric Railway, Buffalo & Lake Erie Traction Company and others.

New Publications

Railway Statistics of the United States of America.—1916. Prepared by Slason Thompson. Bureau of Railway News & Statistics, Chicago, Ill. 148 pages. Paper.

The present issue of this publication, now in its thirteenth year, is for the year ended June 30, 1916. Statistics for steam railroad operation during this period are compared with the official reports for 1915. The pamphlet also contains recent statistics of foreign steam railroads.

Business Finance. By William H. Lough. Ronald Press Company, New York, N. Y. 631 pages. Cloth, $3.

Written from the point of view of the organizer or financial manager of an enterprise, this book deals with the every-day financial problems of the private business concern. Forms of business organization and of security issues, raising capital, handling capital and remedying mismanagement and irregularities—all these are clearly and thoroughly explained. The information given should be of value to him who manages corporate finances or him who criticises their management. Many examples cited in the book are from the utility field, which should amply indicate its applicability to utility finance.

Some Legal Phases of Corporate Financing, Reorganization and Regulation. By Stetson, Byrne, etc. The Macmillan Company, 66 Fifth Avenue, New York, N. Y. 389 pages. Cloth, $2.75.

This book consists of a series of interesting addresses delivered in 1916 before the Bar Association of New York City. Such topics are covered as the preparation of corporate instrument, foreclosure of mortgages, reorganization, federal business laws and public service commissions. While the lectures were intended to aid lawyers who might be engaged in corporate practice in some way, they ought also to be of interest to the utility official who wants to have a general knowledge of corporation finance and law.

Units of Weight and Measure: Definitions and Tables of Equivalents. Bureau of Standards. Technologic Paper No. 47. Government Printing Office, Washington, D. C. Sixty-eight pages. Paper, 15 cents.

This paper is intended to supply the need for various authoritative tables of weights and measures for converting the United States customary units into metric units, and vice versa. It contains sixty-eight pages of definitions and translation tables, and gives official definitions of the units and definite statements as to the spelling and abbreviations of the various units of measurement. Since the use of the metric system in foreign trade is necessary either in catalogs and price lists, in the making up of metric packages, or in working the metric dimensions, the circular will be found especially timely. A copy should be in the hands of every one engaged in foreign trade, scientific or technical work, etc.

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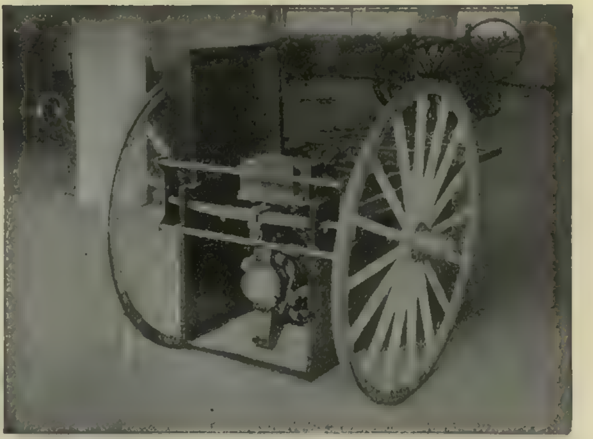

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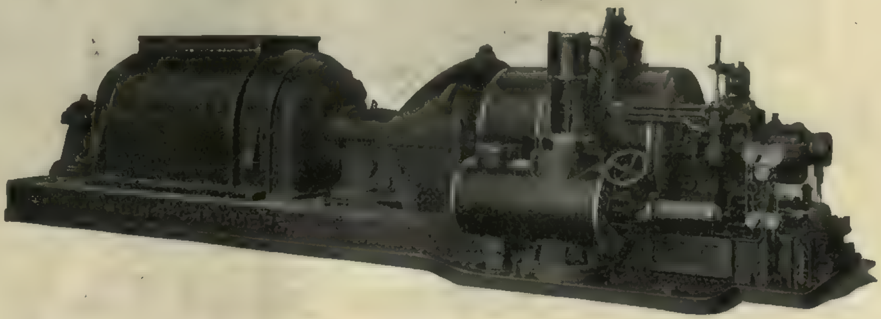

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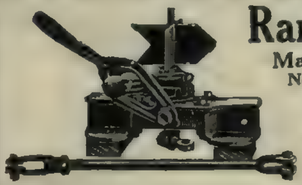

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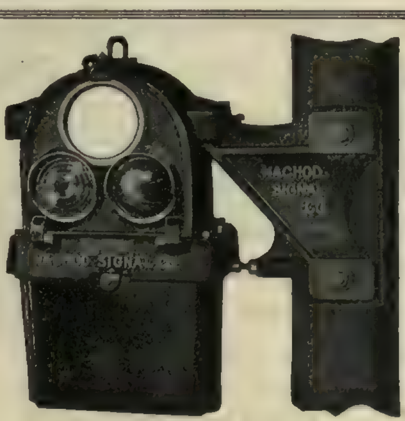

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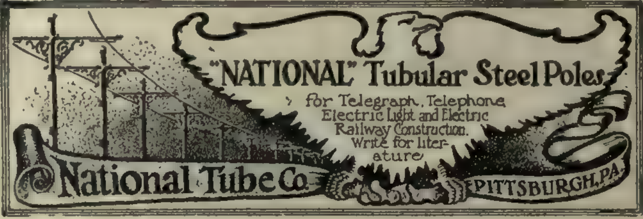

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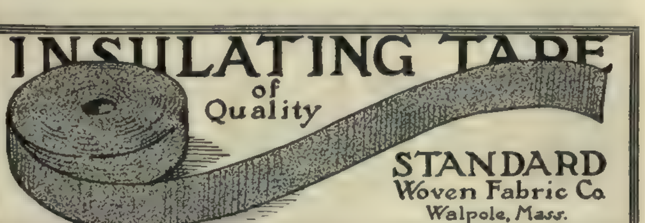

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Lighter in weight than ever before, and yet stronger and more compact.
Rigid Pressed Steel Frame supporting the cushion and the back, upholstered in Rattan.
New type of Shaped Cushion and Back conforms to the lines of the human body in a comfortable sitting posture, affording as much comfort and durability as more elaborate and expensive types.
Greatly increases the seating capacity of car, as seats may be placed in closer centers, though still giving as much room as before.

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HEATING CURRENT
Write for THERMOSTATIC CONTROL INFORMATION

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ELECTRIC HEATERS Cut Installation and Maintenance Charge.
VENTILATORS Also Ventilate in Stormy Weather.
THERMOSTATS Save Current.
ORIGINATED the use of NON-CORROSIVE Wire for Electric Car Heaters.
ORIGINATED The Ventilated Coil Support.

LET US FIGURE ON YOUR NEXT REQUIREMENTS
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BUILT LIKE A WATCH
METERS

—the only means at your disposal to accurately measure the power consumption of cars. You can well afford to investigate. Bulletin 416.

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The Standard for Speed, Accuracy, Durability
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Look for this
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Use them in your terminals—
PEREY TURNSTILES
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Faster than the ticket seller
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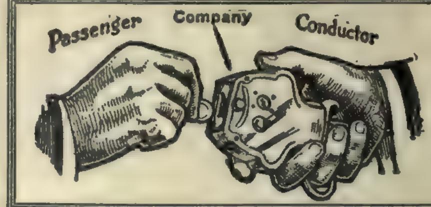
Will Meet Your Needs
The Bonham Recorder Co., Hamilton, Ohio



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for Monitor and Arch Roof Cars, and all classes of buildings; also
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of Car Temperatures.
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The Best Shade Rollers for Cars
SPECIAL shade rollers for cars, that will last and give satisfaction for years, and yet cost but little more than the poorest you can buy, are made by the Stewart Hartshorn Co., E. Newark, N. J. This company is by far the largest shade roller manufacturer in the world. It is able to give high quality at lower prices because of the enormous output. Write for catalog, stating wants. You are always protected when you buy shade rollers if they bear the signature Stewart Hartshorn

Get away from unreliable batteries

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operates directly from the line and always gets plenty of juice. No metal is exposed to the passenger's touch.

The only dependable system.

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These poles are of high grade special skelp, properly reinforced, and will sustain a wheel pressure of from 35 to 40 pounds without taking a permanent bend.

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The Kalamazoo Trolley Wheels

have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.

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KALAMAZOO, MICH., U. S. A.

Ventilation—Sanitation—Economy—Safety

All Combined in

The Cooper Forced Ventilation Hot Air Heater

Patented September 30, 1913. Ask for the full story

We also Manufacture Pressed Steel Hot Water Heaters

THE COOPER HEATER CO. CARLISLE, PA.

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The National Standard
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Car Upholstery

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The only headlining made in one solid piece. Will not separate, warp or blister. Waterproof and homogeneous.

The Pantasote Company

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HEATING AND VENTILATING YOUR CARS is the problem to-day. Let us show you how to do both with one equipment. Now is the time to consider this change before you start your cars through the shops for overhauling. Kill two birds with one stone.

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- Horne Double Acting Brakes
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- Controller Fingers
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The Eclipse Railway Supply Co.

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PROVIDENCE FENDERS H-B LIFE GUARDS

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Manufacturers of The Providence Fender and H-B Life Guard

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An Efficient Ventilator at a reasonable price

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Motors

4—West. 38-B **Motors**, complete with 64 teeth, 4″ bore, split gears, 18 teeth pinions, and gear casings, extra repair parts, 1 new each upper and lower field coils, 1 new set armature coils, 2 new brush holders, 1 new gear and 1 new pinion. Will sell as a complete lot.

Compressors

25—**AA-1 Air Compressors.**

Controllers

12—**K-6 Controllers.**

30—**K-10 Controllers.**

Lathe

1 Pond Standard **Car wheel lathe,** motor driven, with variable speed motor, and with air cylinder attachment for removing and replacing wheels.

For further particulars apply to

W. R. KERSCHNER COMPANY, INC.
50 Church Street, New York

STREET CAR MOTORS

10 Westinghouse No. 306. PRACTICALLY NEW—LESS THAN ONE YEAR IN SERVICE.

12 Westinghouse No. 317-A, with gears and pinions. ABSOLUTELY NEW.

CONTROLLERS

38 Gen. Elec. K-10, with handles and brackets.

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4 1000 KW. SETS:
  Generators: 3 ph., 60 cy., 4500-2300 volts, 300 RPM.
  Motors: 1050 Kva., 3 ph., 25 cy., 6600 volts, 300 RPM.
  Exciters: Direct connected.
  Switchboards: With necessary instruments.

1 100 KW. SET:
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  Motor: 150 HP., 3 ph., 25 cy., 2300 volts, 720 RPM.
  Exciter: 5 KW., direct connected.

ROTARY CONVERTERS AND MOTOR GENERATOR SETS—25 cycles

1 600 KW. Gen. Elec., TC-A, 3 ph., 600 volt, D.C., 375 volt A.C., 8 pole, 375 RPM.

1 600 KW. set consisting of two 300 KW. 6 pole generators, 550 volts. 600 amps., dir. conn. to one 750 HP. synchronous motor, 3 ph., 25 cy., 6600 volt, 500 RPM., complete with AC and DC panels.

4 500 KW. Gen. Elec., HC-K, 600 volt D.C., 4 pole, 750 RPM., each rotary complete with three 165 Kva. Gen. Elec. OI SC Transformers, HP-RP, 6600/5940 volts prim., 430/286/143 volts sec., also necessary panels and instruments.

1 500 KW. Westg., 3 ph., 550 volt D.C., 390 volt A.C., 6 pole, 500 RPM., with dir. conn. starting motor, AC and DC panels and three 175 KW. Westg. oil cooled transformers, 13,200 volts prim., 390 volts sec.

Our new and complete list of steam and electrical equipment will be mailed upon request

MACGOVERN & COMPANY, Inc.
114 Liberty Street, New York City

IMMEDIATE SHIPMENT

1—500 KW. General Electric Curtis steam turbine, 3 ph., 60 cy., 1800 rpm., 2300 volts, 150 lb. steam pressure, vertical type.
1—500 K.W. Westinghouse Horizontal Turbo Generating Unit wound for 3 phase, 60 cycle, 2300 volts, speed 3600 rpm., condensing duty.

25 Cycle Rotary Converters

2—150 KW. General Electric type T.C., 4-150-750, 25 cycle, 3 ph., 575 volt, rotary converters, 750 rpm., complete with end play and speed limit device.

200 Kilowatt 60 Cycle Rotary Converters

1—200 KW. Westinghouse 3 ph., 60 cy. rotary converters, 550 volts, 720 rpm., complete with 4—100 KW. Westinghouse Scott connected oil insulated transformers, 10,000/9500 volts prim., 430/362 volts secy.
1—150 KW. Westinghouse 3 ph., 60 cy., rotary converter, 550 volts, 720 rpm.

Transformers

6—750 KVA. General Electric oil filled self cooled transformers, 4400/281 volts, with 4400-4290-4180-4070-2200-2090-1980 taps in the primary.
3—500 KW. General Electric, 60 cy., single phase transformers, 66,000 volts primary, 4400/2200 volts secondary.
3—375 KVA. Allis Chalmers O. I. S. C. indoor type transformers, 25 cy., 2300 v., 367 v. secy.
3—350 KVA. General Electric, type H, 60 cy., transformers 2400/2300/2200 v. prim., 200/400 v. secy.
1—100 KVA. General Electric, type H, 60 cy. transformer, 4600 volts prim., 115-230 volts secy.
4—100 KW. Westinghouse, oil insulated, Scott connected transformers, 10,000/9500 v. prim., 430/362 v. secy.
3—75 KW. Westinghouse 60 cy. transformers, 2200 v. prim., 110/220/440 v. secy.
3—50 KVA. General Electric type H, 60 cy. transformers, 900/1000/16000 v. prim. Y., 230/460 v. secy.
Also a stock of smaller sized transformers.

IMMEDIATE DELIVERY

ARCHER & BALDWIN, Inc.
114-118 Liberty Street New York City
TELEPHONE 4337-4338 RECTOR

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About 4500

POLES

Long Leaf Yellow Pine

creosoted by standard method with 12 lbs. per cubic foot. The poles are straight, specially selected and finest class 35′ to 36′ long and 14″ to 11¾″ diameter five feet from butt. Poles were inspected, accepted and purchased for a neutral country power line, but shipping conditions prevent moving. Now stored at Mobile. Inspection can be arranged. Further particulars obtainable from the Pyrites Company, Ltd., 15 William Street, New York.

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FOR SALE

If you want

New or Old Steel Rails
Machinery, Cars or Equipment
Write us your needs
Have you seen our new bargain list?

ZELNICKER IN ST. LOUIS

IMMEDIATE SHIPMENT

1—300 K.W. Westinghouse, compound wound, 3 bearing, belt-driven

Generator

speed 435 R.P.M., 550 volts.

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Steam & Electrical Equipment
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FOR SALE

16 W. H. 68

Railway Motors

now running in good condition, with gears, pinions, cases, collars. Will release for delivery during month of July.

Also one set G. E. 1000 Armature Coils—and one 1200 G. E. new field coil.

C. G. & W. St. Ry. Co.
Waynesboro, Penna.

FOR SALE OR EXCHANGE

Two one-man single truck

Passenger Cars

used 3 years. 12 center dump

Ballast Cars

in fair condition. Chicago delivery. Will sell for cash or exchange for baggage and express cars suitable for use as trailers for hauling milk and freight in interurban service.

ELGIN AND BELVIDERE ELECTRIC CO.,
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FOR SALE

Two second-hand

Open Car Bodies

8 seat, 25 feet long over all. One body just painted—other cleaned for painting.

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Rome, Ga.

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Fare Boxes for Sale

40 Johnson registering fare boxes. In excellent operating condition. Greatly reduced prices. For immediate shipment address Nelson P. Hall, Sales Agency, 14 East Jackson Blvd., Chicago, Ill.

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100 tons of 62 lb. Shanghai rails, together with bars, rails practically as good as new, ready for quick shipment. Wire for prices.

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Frick Building, Pittsburgh, Pa.

85 lb. A. S. C. E. Relayers

16,000 tons—with Angle Bars to match. Available immediate shipment and centrally located.
We positively own these Rails and offer same in carload lots and over.
25,000 tons—Relayers—sizes 25 lb. to 100 lb., in stock our Pittsburgh yards and vicinity.
Immediate shipment guaranteed and prices very attractive.
Carload and less than carload inquiries and orders solicited.
Rails cut to length for structural purposes.
Frogs, Switches, Bolts, Nuts, Spikes and all Accessories.

L. B. FOSTER COMPANY
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Everything in the Line of Repairs to Electrical Machinery

Complete Armatures, New Armatures, Rewound Armature Cores, Armature Shafts, Armature Coils, Fields and Commutators.

Established 22 Years.

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For immediate shipment any quantity of battery lead plates, sediment scrap copper and wire, brass and all other grades of scrap material. Write to us today for our prices. National Metal & Rubber Co., 31 India Wharf, Boston, Mass.

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AS superintendent, train master or chief train dispatcher, with a good interurban company. 17 years' experience in operating department of electric and steam railways. Best reference. P. W. 1542 (Utah), Elec. Ry. Journal, San Francisco.

POSITION as superintendent or assistant superintendent of electric railway. Have experience as superintendent, pro tem. of large interurban and city railway and dispatcher of same. Best of references furnished upon request. P W 1551 (Pa.), Elec. Ry. Journal, Philadelphia.

POSITIONS WANTED

OPERATING man, 45, with fifteen years' successful experience as Superintendent and General Superintendent, short line roads, open for engagement on steam or electric line. P. W. 1543 (Cal.), Elec. Ry. Journal, San Francisco.

SUBSTATION and overhead superintendent also experienced in shop work. Good interurban record, 18 years' experience, 10 years in last position. P. W., 1520 (Ill.), Elec. Ry. Journal, Chicago.

SUPERINTENDENT—Competent operating executive thoroughly conversant with modern practice. 20 years' experience in high-speed single track and city operation. Now employed, but desirous of assuming greater responsibilities. Correspondence solicited. P. W., 1535 (N. Y.), Elec. Ry. Journal, N. Y. C.

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For immediate occupancy, 1200 sq. ft. office space in The Engineering Building, Liberty St., N. Y. Unobstructed view from all sides. Ideal location for engineering company or manufacturers' representative. B. O., 1550 (N. Y.), Elec. Ry. Journal.

POSITIONS VACANT

DRAFTSMAN wanted for Master Mechanic's office. Must have good electrical and mechanical knowledge. State salary expected. Man over 31 years old preferred. P. 1544 (Pa.), Elec Ry. Journal, Philadelphia.

TRACK supervisor wanted for city and interurban road. Give details of past experience, together with age, salary expected and references in first letter. P., 1549 (Pa.), Elec. Ry. Journal, Phila.

WANTED: Man for armature winding and all kinds of electrical repairing. Pay 37c. per hour. P. 1541 (Pa.), Elec. Ry. Journal, Philadelphia.

AGENTS AND SALESMEN

Salesman Wants Position

Buyer now connected with large corporation wishes position as salesman for manufacturing company. Am especially fitted to handle hardware or tools. Can furnish unlimited references; not particular as to territory. S., 1548 (Mo.), Elec. Ry. Journal, Chicago.

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The undersigned provides a confidential service designed to locate openings through correspondence for men earning not less than $2,500 and up to $25,000; all lines. Not an employment agency, but a constructive, initiative service, covering individual negotiations. Established 1910. Complete privacy assured; present connections in no way jeopardized. Send name and address only for explanatory details. R. W. Bixby, H1 Niagara Square, Buffalo, N. Y.

READY-REFERENCE INDEX

to products manufactured by advertisers in this issue of Electric Railway Journal

More than 300 different products are here listed.
The Alphabetical Index (see eighth page following) gives the page number of each advertisement.
As far as possible advertisements are so arranged that those relating to the same kind of equipment or apparatus will be found together.

This ready-reference index is up to date, changes being made each week.
If you don't find listed in these pages any product of which you desire the name of the maker, write or wire Electric Railway Journal, and we will probably furnish the information.

Acetylene Apparatus.
(See Cutting Apparatus, Oxy-Acetylene.)

Advertising, Street Car.
Collier, Inc., Barron G.

Air Cleaners.
Horne Mfg. Co.

Air Rectifiers.
Horne Mfg. Co.

Alloys and Bearing Metals.
(See Bearings and Bearing Metals.)

Alloys, Steel and Iron.
Titanium Alloy Mfg. Co.

Anchors, Guy.
Electric Service Supplies Co.
Holden & White, Inc.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Anti-Climbers.
Railway Improvement Co.

Automobiles and Buses.
Brill Co., The J. G.

Axles.
National Tube Co.

Axle Straighteners.
Columbia M. W. & M. I. Co.

Axles, Car Wheel.
Bemis Car Truck Co.
Brill Co., The J. G.
Carnegie Steel Co.
St. Louis Car Co.
Standard Steel Works Co.
Westinghouse Elec. & M. Co.

Babbitting Devices.
Columbia M. W. & M. I. Co.

Badges and Buttons.
Electric Service Supplies Co.
International Register Co., The

Bankers and Brokers.
National City Co.

Batteries, Storage.
Electric Storage Battery Co.

Bearings and Bearing Metals.
Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Eureka Co.
General Electric Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
St. Louis Car Co.
Westinghouse Elec. & M. Co.

Bearings, Center.
Baldwin Locomotive Works.
Holden & White, Inc.

Bearings, Roller and Ball.
Gurney Ball-Bearing Co.
Railway Roller Bearing Co.

Bearings, Roller Side.
Holden & White, Inc.

Bells and Gongs.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail.
Niles-Bement-Pond Co.
Zelnicker Sup. Co., W. A.

Blow Torches for Soldering and Brazing. (See Cutting Apparatus, Oxy-Acetylene.)

Blowers.
General Electric Co.
Westinghouse Elec. & M. Co.

Boilers.
Babcock & Wilcox Co.

Boiler Cleaning Compounds.
Dearborn Chemical Co.

Boiler Tubes.
National Tube Co.

Bond Clips.
Electric Railway Improvement Co.

Bond Testers.
American Steel & Wire Co.

Bonding Apparatus.
Electric Railway Improvement Co.
Ohio Brass Co.

Bonding Tools.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Rail.
American Steel & Wire Co.
Electric Railway Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Bonds, Welded.
Lincoln Bonding Co.

Book Publishers.
McGraw-Hill Book Co., Inc.

Boring Tools, Car Wheel.
Niles-Bement-Pond Co.

Braces, Rail.
Kilby Frog & Switch Co.

Brackets and Cross Arms. (See also Poles, Ties, Posts, Etc.)
Bates Expanded Steel Truss Co.
Electric Service Supplies Co.
Hubbard & Co.
Lindsley Bros. Co.
Ohio Brass Co.

Brake Adjusters.
Holden & White, Inc.
Smith-Ward Brake Co.

Brake Shoes.
Amer. Brake Shoe & Fdy. Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Long Co., E. G.
St. Louis Car Co.

Brakes, Brake Systems and Brake Parts.
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Union Electric Co.
Westinghouse Trac. B. Co.

Brooms, Track, Steel or Rattan.
Zelnicker Supply Co., W. A.

Brush Holders.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.

Brushes, Carbon.
American Carbon & Battery Co.
General Electric Co.
Jeandron, W. J.
Morgan Crucible Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite.
Dixon Crucible Co., Jos.

Bumpers, Car Seat.
Electric Service Supplies Co.

Bushings, Case Hardened and Manganese.
Bemis Car Truck Co.

Bushings, Fibre.
Diamond State Fibre Co.

Buttons. (See Badges and Buttons.)

Cables. (See Wires and Cables.)

Carbon Brushes. (See Brushes, Carbon.)

Car Equipment. (For Fenders, Heaters, Registers, Wheels, etc.—See those headings.)

Car Stops—Automatic.
Consolidated Car Heating Co.

Car Trimmings. (For Curtains, Registers, Doors, Seats, etc. —See those headings.)

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Jewett Car Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Stephenson Co., John.
Wason Mfg. Co.

Cars, Second Hand.
Electric Equipment Co.
Kerschner Co., Inc., W. R.

Cars, Self-Propelled.
Electric Storage Battery Co.
General Electric Co.

Castings, Brass.
Columbia M. W. & M. I. Co.
Eureka Co.
Frankel Connector Co.

Castings, Composition or Copper.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
Horne Mfg. Co.

Castings, Gray Iron and Steel.
Amer. Brake Shoe & Fdy. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.
Standard Steel Works Co.
Union Spring & Mfg. Co.

Castings, Malleable and Brass.
Amer. Brake Shoe & Fdy. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co
Horne Mfg. Co.
Long Co., E. G.
St. Louis Car Co.

Catchers and Retrievers, Trolley.
Eclipse Railway Supply Co.
Electric Service Supplies Co.
Holden & White, Inc.
Horne Mfg. Co.
Kerschner Co., Inc., W. R.
Long Co., E. G.
Ohio Brass Co.
Union Electric Co.
Wood Co., Chas. N.

Ceiling, Car.—(See head lining.)

Charging Sets, Storage Battery.
General Electric Co.
Lincoln Electric Co.

Chemists.
Little, Inc., Arthur D.

Circuit Breakers.
Cutter Electrical & Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors for Wires and Cables.
Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
Frankel Connector Co.
General Electric Co.
Hubbard & Co.
Klein & Sons, Mathias.
Ohio Brass Co.
Union Electric Co.
Westinghouse Elec. & M. Co.

Cleaners and Scrapers, Track. —(See also Snow-Plows, Sweepers and Brooms.)
Brill Co., The J. G.
Ohio Brass Co.

Cleats, Car Wiring.
General Electric Co.

Clusters and Sockets.
General Electric Co.

Coal and Ash Handling.—(See Conveying and Hoisting Machinery.)

Coasting Clocks.
Railway Improvement Co.

Coil Banding and Winding Machines.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Coils, Armature & Field.
Cleveland Armature Works.
Columbia M. W. & M. I. Co.
D & W Fuse Co.
General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines.
International Register Co., The.
Johnson Fare Box Co.

Commutator Slotters.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices.
General Electric Co.

Model 370—A.C. and D.C. Ammeter

One of the Portable Electrodynamometer Group, which also includes Model 310 Single Phase and D.C. Wattmeter, Model 329 Polyphase Wattmeter and Model 341 A.C. and D.C. Voltmeter.

The characteristics of the group are extreme accuracy (guaranteed within a fraction of 1% full scale value), adaptability for use on circuits of any commercial frequency and any wave form, great overload capacity, low moment of inertia, effective damping and shielding, and the legibility and remarkable uniformity of the hand calibrated scales.

Idealism That is Practical

To attain the highest possible standard of service is the dominating purpose which subordinates all other considerations in the designing and building of

Weston

Indicating Instruments

Especially in this field of Electrical Measurement, such an ideal is thoroughly consistent with practical commercial demands. So it is that Weston preeminence is as well recognized from the commercial standpoint as from the scientific.

Weston Indicating Instruments include a great variety of groups for portable or switchboard service on A. C. or D. C. Circuits, Instruments designed expressly for testing and laboratory use, for motor car and boat electrical systems, and many others for special purposes. Write for Bulletins or Catalogs describing those which interest you.

Weston Electrical Instrument Company
21 Weston Ave., Newark, N. J.

New York, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Chicago, Boston, Buffalo, Richmond, San Francisco, Denver, Detroit, St. Louis, Toronto, Winnipeg, Montreal, Vancouver, London, Paris, Petrograd, Florence, Johannesburg, S. Africa

National Railway Appliance Company

50 East 42d St., NEW YORK CITY
Chicago Washington, D. C.

RAILWAY SUPPLIES

SELLING AGENTS FOR

- Tool Steel Gears and Pinions
- Johnson Fare Box
- Perry Side Bearings
- Hartman Centering Center Plates
- Wasson Trolley Bases
- Garland Ventilator
- Electric Arc Welders
- High Class Railway Varnishes and Enamels
- Elastic Car Waste

Special Agents for:
- Tool Steel Gear & Pinion Co.
- Johnson Fare Box Co.
- C. & C. Electric & Mfg. Co.
- Holden & White

General Agents for Anglo-American Varnish Co.
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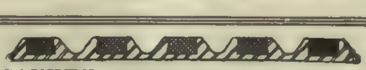

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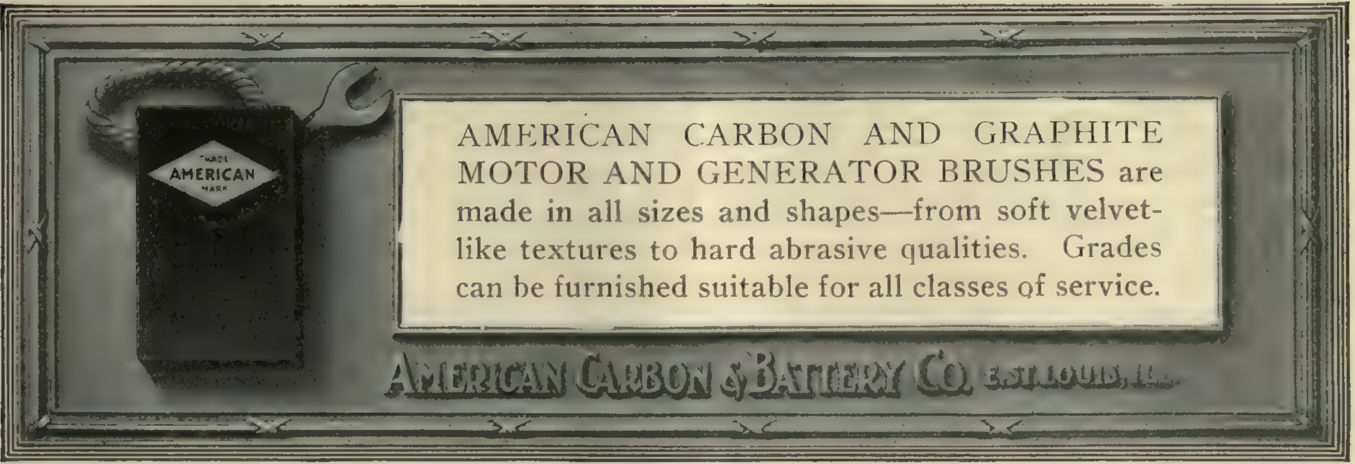

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Columbia M. W. & M. I. Co.
Kilby Frog & Switch Co.
New York Switch & Crossing Co.
Ramapo Iron Works.

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Archbold-Brady Co.

Transformers.
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General Electric Co.
Packard Electric Co.
Westinghouse Elec. & M. Co.

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American Mason S. T. Co.
Universal Safety Tread Co.

Trolley Bases.
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General Electric Co.
Holden & White, Inc.
Horne Mfg. Co.
Nuttall Co., R. D.
Ohio Brass Co.
Union Electric Co.

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Trolleys & Trolley Systems.
Ford Chain Block & Mfg. Co.

Trolley Shoes.
Holden & White, Inc.

Trolley Wheels. (See Wheels, Trolley.)

Trucks, Car.
Baldwin Locomotive Works.
Bemis Car Truck Co.
Brill Co., The J. G.
Long Co., E. G.
St. Louis Car Co.

Tubing, Steel.
National Tube Co.

Turbines, Steam.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co

Turbines, Water.
Allis-Chalmers Mfg. Co.

Turnstiles.
Perey Mfg. Co., Inc.

Union Couplings.
National Tube Co.

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Allis-Chalmers Mfg. Co.

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Globe Ventilator Co
Holden & White, Inc.
Railway Utility Co.
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Brill Co., The J. G.

Voltmeters. (See Instruments.)

Washers.
Diamond State Fibre Co.

Welders, Electric Arc.
Lincoln Electric Co.

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Electric Railway Improvement Co.
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Goldschmidt Thermit Co.
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Lincoln Electric Co.
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Wheel Presses. (See Machine Tools.)

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Long Co., E. G.

Wheels, Car, Steel and Steel Tired.
Bemis Car Truck Co.
Carnegie Steel Co.
Standard Steel Works Co.

Wheels, Trolley.
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Columbia M. W. & M. I. Co.
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Eureka Co.
General Electric Co.
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Long Co., E. G.
Nuttall Co., R. D.
Star Brass Works.
Union Electric Co.

Whistles, Air.
General Electric Co.
Ohio Brass Co.

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Wire Rope.
American Steel & Wire Co
Roebling's Sons Co., John A

Wires and Cables.
Aluminum Co. of America.
American Steel & Wire Co
Bridgeport Brass Co.
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NOTICE TO ADVERTISERS:

Printing begins on Tuesday of each week.

Changes of copy received up to 10 A. M. Monday will appear in the issue of the following week, but no proofs can be submitted for OK before publication.

New Advertisements (not changes of copy) received up to Wednesday noon can appear in the issue of that week, but no proofs can be shown.

If proofs before printing are required, change of copy and copy for new advertisements must be in our hands 10 days in advance of the date of publication.

A

Page

Ajax Metal Co. 45
Allis-Chalmers Mfg. Co. 29
Aluminum Co. of America 31
Amer. Brake Shoe & Fdry. Co. 47
American Car Co. 51
American Carbon & Battery Co. 45
American Mason S. T. Co. 43
American Steel & Wire Co. 33
Anderson Mfg. Co., A. & J. M. 32
Archbold-Brady Co. 32
Archer & Baldwin, Inc. 38
Arnold Co., The 28
Arthur Power-Saving Recorder Co., The 17
Asbestos Protected Metal Co. Front Cover

B

Babcock & Wilcox Co. 34
Baldwin Locomotive Works, The 45
Bates Expanded Steel Truss Co. 31
Beeler, John A. 28
Bemis Car Truck Co. 46
Bonham Recorder Co. 36
Bonney-Vehslage Tool Co. 36
Bridgeport Brass Co. 6
Brill Co., The J. G. 51
Buckeye Jack Mfg. Co. 33
Byllesby & Co., H. M. 28

C

Canton Culvert & Silo Co. 33
Carnegie Steel Co. 45
Carney & Co., B. J. 32
Cleveland Armature Works 39
Cleveland Frog & Crossing Co. 33
Collier, Inc., Barron G. 22
Columbia M. W. & M. I. Co. 20
Consolidated Car Fender Co. 37
Consolidated Car-Heating Co. 37
Cooper Heater Co., The 37
Cutter Co., The 33

D

D & W Fuse Co. 35
Daum, A. F. 35
Dearborn Chemical Co. 34
Delta Star Electric Co. 32
Diamond State Fibre Co. 32
Dixon Crucible Co., Joseph 34
Drum & Co., A. L. 28
Duff Manufacturing Co., The 34

E

Eclipse Ry. Supply Co. 37
Electric Equipment Co. 46
Electric Railway Improve. Co. 13
Electric Service Supplies Co. 11

Page

Electric Storage Battery Co. 45
Elec'l Testing Laboratories 28
Eureka Co. 35

F

Federal Signal Co. 32
Ford, Bacon & Davis 28
Ford Chain Block & Mfg. Co. 35
"For Sale" Ads 38, 39
Frankel Connector Co. 31

G

Galena-Signal Oil Co. 16
General Electric Co. 24, Back Cover
Globe Ventilator Co. 37
Gold Car Heating & Lighting Co. 36
Goldschmidt Thermit Co. 10
Green Eng'g Co. 33
Gurney Ball Bearing Co. 50

H

Hale & Kilburn Co. 36
Hartshorn Co., Stewart 36
"Help Wanted" Ads 39
Holden & White, Inc. 36
Horne Mfg. Co. 37
Hubbard & Co. 32
Hunt & Co., Robert W. 28

I

Independent Lamp & Wire Co. 41
Ingersoll-Rand Co. 43
International Register Co., The 18
International Steel Tie Co., The 9

J

Jackson, D. C. & Wm. B. 28
Jeandron, W. J. 43
Jewett Car Co. 30
Johnson Fare Box Co. 19

K

Kerschner Co., Inc., W. R. 38
Kilby Frog & Switch Co. 33
Kinnear Mfg. Co. 35

Page

Klein & Sons, Mathias 32
Kuhlman Car Co., G. C. 51

L

Lackawanna Steel Co. 14
Lincoln Bonding Co. 29
Lincoln Electric Co. 15
Lindsley Bros. Co. 32
Little, Inc., Arthur D. 28
Long Co., E. G. 43

M

McCardell & Co., J. R. 32
McGraw-Hill Book Co., Inc. 21
MacGovern & Co., Inc. 38
Morgan Crucible Co. 47
Murphy Iron Works 33

N

Nachod Signal Co., Inc. 31
National Brake Co. 27
National City Co. 28
National Railway Appliance Co. 41
National Tube Co. 32
Nelsonville Brick Co. 31
New York Switch & Cross. Co. 33
Niles-Bement-Pond Co. 35
Nuttall Co., R. D. 37

O

Ohio Brass Co. 7

P

Packard Electric Co. 35
Page Woven Wire Fence Co. 32
Pantasote Co., The 37
Perey Mfg. Co., Inc. 36
"Positions Wanted" Ads 39
Power Specialty Co. 34
Pyrites Co., Ltd. 38

R

Railway Improvement Co. 23
Railway Roller Bearing Co. 45
Railway Track-work Co. 12
Railway Utility Co. 36

Page

Ramapo Iron Works 31
Richey, Albert S. 28
Roebling's Sons Co., John A. 32
Rooke Automatic Register Co. 36

S

St. Louis Car Company, The 47
Samson Cordage Works 43
Sanderson & Porter 28
Sangamo Electric Co. 36
Scofield Engineering Co. 28
Searchlight Section 38, 39
Second Hand Equip. 38, 39
Sherwin-Williams Co. 35
Simmen Automatic Railway Signal Co. 32
Smith Heater Co., Peter 37
Smith-Ward Brake Co. 45
Standard Steel Works Co. 30
Standard Woven Fabric Co. 35
Star Brass Works 37
Stephenson Co., John 51
Stone & Webster Eng'g Corp. 28

T

Titanium Alloy Mfg. Co. 49

U

Union Electric Co. 34
Union Spring & Mfg. Co. 46
Universal Safety Tread Co. 43

V

Van Dorn Coupler Co. 43

W

"Want" Ads 39
Wason Mfg. Co. 51
Western Red Cedar Assn. 8
Westinghouse Elec. & Mfg. Co. 2, 5
Westinghouse Traction Brake Co. 4
Weston Elec'l Instrument Co. 41
White Companies, The J. G. 28
Wisch Service, The P. Edw. 46
Wood Co., Chas. N. 32
Woodmansee & Davidson, Inc. 28

Z

Zelnicker Supply Co., Walter A. 39

Los Angeles has bought 19,000 *tons*
TITANIUM-TREATED RAIL

Since 1910 the Los Angeles Railway has bought 19,000 tons of Titanium-treated rail, most of it for 116 lb. heavy service section.

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145

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The Lightest of All Trucks

Judged by the numbers built each year, the Brill Single Motor Truck, 39-E, has been the foremost truck in the electric railway field for the last seven years. The reason is plain. It is a city truck and the big city systems of the world operate a larger number of cars by far than the other classes of electric railways together, and as they use mostly double-trucks and need the type of truck that gives the highest service and greatest economy, the majority of them have chosen the 39-E as their standard. As it is subjected to very considerably less weight and strain than the double-motor truck, the single-motor type is of lighter construction. Weight, too, is saved by the use of pony wheels and their smaller axles. Less weight and single-motor equipment means less initial cost, less operating cost and less maintenance cost for both trucks and motors.

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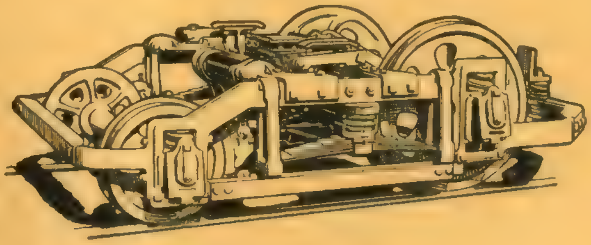

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The success of the commutating pole generator on G-E motor generators used in heavy railway service is well known.

For extremely heavy service the G-E Generators are now equipped with compensating pole-face windings.

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Benton Harbor & St. Joe Railway		1- 500 KW
Butte, Anaconda & Pacific Railway	(Total of 7)	2- 1000 KW
Columbus Ry. Pr. & Lt. Company		1- 750 KW
Detroit Edison Company		6- 1000 KW
Detroit United Railway		2- 1500 KW
El Paso Electric Company		1- 300 KW
Great Western Pr. Company		3- 2000 KW
Holyoke St. Ry. Company		1- 500 KW
Lincoln Traction Company		1- 500 KW
Nashville Rwy. & Lt. Company		1- 2000 KW
Pittsburgh, Harmony, Butler & New Castle Ry.		2- 500 KW
Public Service Elect. Company		1- 1000 KW
Public Utilities Company		1- 1000 KW
Rockland, Thomaston & Camden St. Ry.		1- 400 KW
Spokane & Inland Empire Railway		1- 2000 KW
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